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VOL. XXXV. MARCH 1928 No. 1

NEW COLEOPTERA FROM WESTERN HOT SPRINGS[1]

By P. J. Darlington, Jr.

The three descriptions brought together in this paper are of widely different species which have in common only aquatic habits and an apparent preference for thermal water. They were collected with a number of described species by Professor C. T. Brues in Nevada, Oregon, and California during the summer of 1927, and are described now so that the names will be available for use by Professor Brues in his paper on the hot spring fauna, which will probably appear in the Proceedings of the American Academy of Arts and Sciences.

I am indebted to Mr. Nathan Banks and Director Thomas Barbour of the Museum of Comparitive Zoölogy at Cambridge for permitting me to study the types of *Ochthebius* and *Helmis* in the LeConte collection, and to Mr. H. C. Fall for the opportunity of examining some of the types of his species of *Cœlambus*.

By arrangement with Professor Brues, the holotype, allotype if any, and some of the paratypes of each species will be deposited in the Museum of Comparative Zoölogy, Cambridge, Massachusetts.

Coelambus thermarum n. sp.

Moderately elongate, oval. Front not margined. Head and pronotum piceous, the former with a small spot on the vertex, the latter with the side margins, vaguely paler; elytra pale testaceous and semi-transparent except for the fuscous

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[1] Contribution from the Entomological Laboratory of the Bussey Institution, Harvard University, No. 288.

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suture, a fine fuscous line along the sutural series of impressed punctures, and a large faint irregular infuscate cloud on the disk extending from just before the middle nearly to apex. Body beneath black; legs rufo-piceous; antennæ rufous with the outer joints infuscate. Integuments shining above and below. Disk of pronotum and elytra moderately densely punctured with rather fine punctures which may become sparse on the pronotum at middle, and which scarcely vary in size on the elytra except for the distinctly impressed sutural and discal series; metasternum, coxal plates, and sides of ventral segments coarsely punctured; epipleuræ more finely but rather closely punctured. Hind femora finely strigose in both sexes.

♂ characters: pro- and mesotarsi a little broader than in the ♀, claws small and unmodified; front femur broader than in the ♀, shining and bent downward apically, deeply transversely impressed on the anterior face a little before apex, posterior face with a longitudinal line of long silky pubescence near the upper margin and a shorter one apically near the lower margin; front tibia a little broader than in the ♀, with a longitudinal line of silky pubescence along the middle of the posterior face; middle femur sinuate and produced downward (inward) in a small shining lobe at apex, broadly lobed below at base, the lobe flattened and punctate on the anterior face; middle tibia nearly parallel sided except for a small lobe internally near base; hind femur broader than in the ♀; hind tibia with sexual pubescence along the lower edge.

♀ characters: no unusual modifications except that the middle tibia is slightly broadened at base where it is lobed in the ♂.

Length: 4.1-3.2 mm. Width: 2.0-1.6 mm. Holotype: 4.0 x 2.0 mm.

Holotype ♂ and allotype ♀ no. 15948 in the Museum of Comparative Zoölogy, collected by Professor C. T. Brues in "Hot Spring no. 23-a; Temperature 30°; 37 mi. So. of Battle Mtn., Nevada." Paratypes: 2 ♀'s with the same data as the holotype; 6 ♂'s, 2 ♀'s from "Hot Spring no. 20; Temperature 38 ; 29 mi. So. of Winnemucca, Nevada," also collected by Professor Brues. Paratypes to be deposited in the Museum of

Comparative Zoölogy, the United States National Museum, the California Academy of Sciences, the collection of Mr. H. C. Fall, and the collection of the writer.

The semi-transparent elytra and striking secondary sexual characters of the ♂ make this a very distinct and easily recognized species. In Mr. Fall's table in the "North American Species of *Cœlambus*," published by John D. Sherman Jr., Mt. Vernon, N. Y., 1919, it would run to near *C. pedalis* Fall, from which it may be distinguished by several definite characters. Direct comparison shows that *C. thermarum* is also a narrower species with a proportionately smaller prothorax and narrower head. For the opportunity of examining the type and type series of *C. pedalis* at Tyngsboro I am indebted to Mr. Fall, whose excellent revision of *Cœlambus* has made the placing of the present species ridiculously easy.

Ochthebius bruesi n. sp.

Elongate, slightly depressed. Black; head and pronotum with distinct æneous or metallic rose reflections; elytra entirely piceous to testaceous with piceous humeri and base; legs dull rufous, tarsi and basal part of femora darker; antennæ and maxillary palpi rufous, the latter with the ultimate and the tip of the penultimate joints fuscous. Ultimate joint of maxillary palpus twice as long as wide, narrowed and rounded at apex, but subject to modification; penultimate joint typically convex on all sides, but at times flattened and concave on one side, as described below. Head bifoviate between the eyes; labrum entire, feebly rounded in front. Prothorax about two-fifths wider than long, widest about two-sevenths from the distinct but not prominent apical angles, rather strongly narrowed and with very broadly and evenly recurved sides in posterior five-sevenths; lateral transparent membrane beginning a little behind anterior angles, widest near base, where about one-seventh as wide as prothoracic base; median groove well impressed, nearly complete; discal impressions deep, well separated, the posterior longer, placed nearly as in *O. interruptus*; lateral grooves narrow, well impressed; pronotal disk rather strongly shining, not or but very slightly alutaceous, sparsely punctured. Elytra about one and two-thirds times as long as wide; sides explanate to about one-third from apex; disk slightly shining; striæ closely punctate to apex, where they are a little confused.

Length: 2.1-2.3 mm. Width: 0.9-1.0 mm.

Holotype number 15950 in the Museum of Comparative Zoölogy, collected by Professor C. T. Brues in "Hot Spring no. 24; Temperature 38.8°; Beowawe, Nevada." Paratypes: 24 with the same data as the holotype; 1 collected by Professor Brues in "Hot spring no. 9; Amedee, California." Paratypes to be deposited in the Museum of Comparative Zoölogy, the United States National Museum, the Canadian National Collection, the California Academy of Sciences, the collection of Mr. H. C. Fall, and that of the writer.

In Horn's table (Trans. American Ent. Soc., 1890, pp. 18-19) *O. bruesi* would fall in *Ochthebius s. str.* near *interruptus* and *attritus*, from both of which it differs in being larger and more elongate and in having both the discal and lateral impressions strongly marked. The legs are longer and stronger, and the entire insect has a distinctive loose-jointed appearance which is difficult to describe. I have seen all the older types of the genus in the LeConte collection at Cambridge, and have studied all the more recent American descriptions, none of which can fit the species here described.

The penultimate joint of the maxillary palpus is rather curiously and consistently deformed in certain of the specimens at hand. Normally it is rounded on all sides and rather thick, but sometimes it is flattened in the vertical plane and concave on one side. In this case the ultimate and apparently the pseudobasal joints are also strongly flattened. Of the twenty four specimens in which the palpi can be clearly seen, thirteen are normal on both sides, two have the right palpus only deformed, two have the left palpus only deformed, and six have both palpi deformed. One specimen has the left palpus normal and the right with the penultimate joint represented by a small globular body and the ultimate joint absent. How this wholesale malformation has been produced I do not know.

I take great pleasure in naming this insect after its collector, in recognition of his success in collecting hot spring Coleoptera.

Helmis thermarum n. sp.

Elongate, parallel, rather convex. Black or piceous; tarsi, palpi, and antennæ dull rufous. Last joint maxillary palpus about one and one-half times as long as wide. Antennæ eleven-jointed with the second joint distinctly and evenly inflated. Prosternal intercoxal process not quite half as wide as the mesosternum between the coxæ; meso- and metasterna sulcate along the middle; last ventral segment finely notched at sides. Femora sides of ventral surface, and inner side of front tibiæ at apex clothed with a dense mat of silvery hair, which may, however, be partly rubbed away. Prothorax rectangular, distinctly longer than wide, a little narrowed at base and apex, the sides broadly and shallowly emarginate two-fifths from apex where there is a complete transverse impression on the pronotal disk; lateral margins finely crenate, nearly paralleled on the disk, about a fifth of the prothoracic width from the sides, by a pair of fine lateral costæ which extend from base to apex except that they may be partly or almost entirely obsolete on the interior two-fifths; pronotum in anterior two-fifths faintly shining, evenly convex, sparsely punctate; pronotum in anterior three-fifths opaque, with a low rounded "Y"-shaped elevation running from the middle of the base to the transverse impression, where the arms of the "Y" terminate on each side of a central foveate depression; on each side there is also an oblique elevation extending from near the base of the "Y" to near the pronotal margin two-fifths from base. Elytra about twice as long as wide, the sides parallel from just back of humeri to apical third; disk dull, finely pubescent; third interval not or but slightly prominent at base, seventh interval with a fine inconspicuous costa; discal striæ marked by rows of very coarse punctures which are larger and sub-confluent toward elytral base and which extend to apex, giving the whole elytron the appearance of being irregularly cribrate.

Length: 1.4-1.7 mm. Width: 0.5± mm.

Holotype number 15949 in the Museum of Comparative Zoölogy, collected by Professor C. T. Brues in "Hot Spring no. 15; Opal Mine 25 mi. So. Denio, Ore." Paratypes: 61 with the same data as the holotype. Paratypes to be deposited in the Museum of Comparative Zoölogy, the United States National Museum, the Canadian National Collection, the California Academy of Sciences, the collection of Mr. H. C. Fall, and that of the writer.

This species is allied by the pronotal sculpture and the character of the ventral pubescence to *Helmis pusilla, foveata,* and *similis,* but it may be easily distinguished by its much narrower form and the coarsely punctate, inconspicuously costate elytra. Occasionally the punctures of the elytra are filled up or concealed by a superficial layer of dirt, but the remaining characters are sufficient to make the species readily recognizable. Professor Brues found two specimens of *H. similis* in the same locality.

A NEW SPECIES OF PROBOLOMYRMEX FROM JAVA.

By William Morton Wheeler,
Bussey Institution, Harvard University.

In a collection of Javanese ants kindly sent me by Dr. K. Dammerman I find four workers of an interesting undescribed species of the little known Ponerine genus Probolomyrmex, which Mayr in 1901 (Ann. k. naturhist. Hofmus. Wien 16, p. 2) based on the worker of a species, *filiformis*, taken by Dr. Hans Brauns at Port Elizabeth, Cape Colony. More recently, Mann (Psyche 30, 1923 p. 16, fig. 2) has described and figured the deälated female of another species, *boliviensis*, from Rurrenabaque, Bolivia. Owing to the difference in caste, he was doubtful of the generic allocation of his specimen, but Emery's figures of the type, in the "Genera Insectorum" (Ponerinæ 1910, Pl. 2, figs. 10, 10a) show that the Bolivian species is a true Probolomyrmex. The finding of a third species in Indonesia now shows that the generic distribution in Africa and South America cannot be used as evidence of former geological connection between these continents, but that Probolomyrmex, like Discothyrea, Centromyrmex, etc., must be regarded as a genus of archaic, tropicopolitan, relict species, and perhaps as the remains of a formerly cosmopolitan group. The rather pale color and complete absence of eyes in the worker and the very small eyes and ocelli in the female, show that the Javan form, as well as the other two species, are hypogæic in habit like all the other Proceratiini (Proceratium, Sysphincta, Discothyrea, Prodiscothyrea and Escherichia).

Probolomyrmex dammermani sp. nov.

Worker. Length 2-2.5 mm.

Head subelliptical, one and one-half times as long as broad, slightly narrower in front than behind, with evenly rounded, feebly convex sides and slightly concave posterior border; in profile rather convex dorsally, with straight gular surface, without any traces of eyes or ocelli. Mandibles very small, narrow and convex, with four minute, indistinct, oblique teeth. Clypeus as in *P. filiformis*, projecting forward and concealing the mandibles and with a median ridge formed by the coalescence of the frontal carinæ which terminate posteriorly in a short bifurcation. Frontal groove absent. Antennæ stouter than in *filiformis*, the scapes reaching to about the posterior fifth of the head; first funicular joint not longer than broad; joints 2-10 decidedly broader than long, gradually increasing in width apically, the penultimate joint more than twice as broad as long, the terminal joint glandiform, not more than one-third longer than broad and scarcely as long as the three preceding joints together. Thorax shaped much as in *filiformis*, long and narrow, without sutures, the dorsal outline even and straight, except anteriorly where it is feebly convex. Prosternal angles sharp; epinotal declivity perpendicular and concave, on the sides sharply marginate and distinctly dentate. Petiole elongate, laterally compressed, from above nearly twice as long as broad, about one-fourth broader behind than in front, and with feebly rounded sides; in profile nearly one and one-half times as long as high,

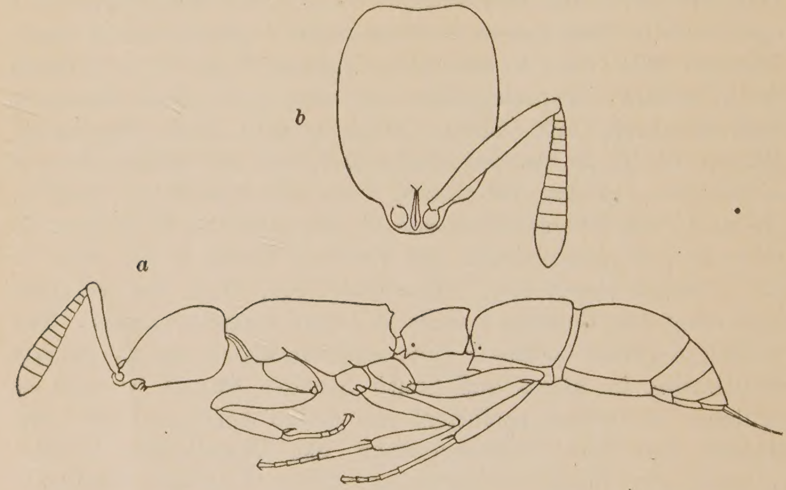

Fig. 1. *Probolomyrmex dammermani* sp. nov. worker. *a*, profile view; *b*, dorsal view of head more enlarged.

highest behind where it is concavely truncated; the dorsal surface convex, rising evenly to the posterior truncation, the ventral surface convex in the middle, at the anterior end with an acute tooth which is directed forward. Postpetiole strongly constricted off from the first gastric segment, one and one-fourth times as long as broad, narrowed anteriorly, evenly convex dorsally and laterally, its anteroventral protuberance rather sharply angular in profile. First gastric segment as long as the postpetiole, longer than broad. Sting very long and slender. Legs long.

Nearly opaque throughout, legs scarcely more shining; very densely, finely and evenly punctate, the head and thorax somewhat more distinctly.

Hairless; pubescence white, extremely fine, forming a delicate bloom, most distinct on the thorax and abdomen.

Clear ferruginous red, the head in some specimens a little paler than the thorax; anterior portion of head, clypeus, mandibles, antennæ, legs and gaster beyond the first segment reddish yellow.

Described from four specimens taken Dec. 18, 1922 by Dr. Karl Dammerman at Buitenzorg, Java.

This species is smaller than *P. filiformis*, which measures 3 mm.; its antennal funiculi are decidedly thicker, with broader joints, the epinotum is distinctly dentate and the ventral portion of the petiole has no lamella and its anterior tooth is directed forward instead of backward. The female *P. boliviensis* Mann resembles the Javan species in its smaller size (the female measures only 2.8 mm.), in the shape of the antennal funiculi and the ventral portion of the petiole, but the dorsal portion of the latter is higher and has a very different outline in profile, the postpetiole is shorter than the first gastric segment and the color is more brownish red. This last character, however, may be peculiar to the female.

ANTS OF NANTUCKET ISLAND, MASS.

BY WILLIAM MORTON WHEELER,
Bussey Institution, Harvard University.

After making an intensive study of the insect fauna of Nantucket Island, Mr. C. W. Johnson has turned over to me for identification all the ants which he was able to collect. There are seventeen different forms, all of which, with the exception of *Monomorium minimum*, are common on the New England mainland. The absence of certain conspicuous species, especially of the genera Aphænogaster and Prenolepis, is worthy of note.

1. *Ponera coarctata* Latr. subsp. *pennsylvanica* Emery. A single male.

2. *Myrmica brevinodis* Emery var. *canadensis* Wheeler. Workers, females and males.

3. *Myrmica scabrinodis* Nly. var. *sabuleti* Emery—Workers, females and males.

4. *Monomorium minimum* Buckley.—A single winged female. This is a southern species which has entered New England along the coast. It has been taken near New Haven, Conn., at Providence, R. I. and at Woods Hole, Mass. The only inland record is Wellesley, Mass. (A. P. Morse).

5. *Crematogaster* (*Acrocœlia*) *lineolata* Say.—Workers, females and males.

6. *Tapinoma sessile* Say.—Workers and a deälated female.

7. *Dolichoderus* (*Hypoclinea*) *plagiatus* Mayr var. *inornatus* Wheeler.—A worker and a winged female.

8. *Lasius niger* L. subsp. *alienus* Först. var. *americanus* Emery.—Workers and females.

9. *Lasius* (*Chthonolasius*) *brevicornis* Emery—Workers, females and males.

10. *Formica truncicola* Nyl. subsp. *obscuriventris* Mayr. var. *gymnomma* Wheeler.—Single worker, female and male specimens.

11. *Formica difficilis* Emery var. *consocians* Wheeler.—Workers. This ant is a temporary social parasite of *F. schaufussi* var. *incerta*.

12. *Formica exsectoides* Forel.—Workers. This is a temporary social parasite of *F. fusca* var. *subsericea.*

13. *Formica fusca* L. var. *subsericea* Say.—Workers and females.

14. *Formica* (*Neoformica*) *pallidefulva* Latr. subsp. *schaufussi* Latr.—Workers.

15. *Formica* (*Neoformica*) *pallidefulva* subsp. *schaufussi* var. *incerta* Emery.—Workers.

16. *Formica* (*Neoformica*) *pallidefulva* subsp. *nitidiventris* Emery var. *fuscata* Emery.—Workers.

17. *Camponotus herculeanus* L. subsp. *ligniperda* Latr. var. *noveboracensis* Fitch.—Workers.

NOTES ON THE GENUS *PROCTACANTHUS* WITH THE DESCRIPTIONS OF TWO NEW SPECIES (DIPTERA: ASILIDAE)

By Stanley W. Bromley.

Proctacanthus is a genus of large robber flies, the majority of species of which are found in the New World. Practically all the species with which I am familiar inhabit dry fields or pastures, several being restricted to dry sandy plains.

In 1923, I published a short article (Psyche, Vol. XXX, No. 2, April, 1923, pp. 41-45.) dealing with the food habits of two species (*Proctacanthus rufus* Willist. and *P. brevipennis* Wied.) occurring in the latter situations. I did not mention in the article that the species concerned were identified by myself by comparison with specimens determined by Mr. C. W. Johnson.

Since the publication of this paper, I discovered that the specimens, determined as *P. rufus* Willist. would not fit the description of this species as given by Hine (Annals Ent. Soc. Am. Vol. IV, pp. 153-172. 1911) but rather would run to the next species given as *rufiventris* Macq. The principal differences between the two are cited by Hine as being the enlarged hypopygium and uniform red thorax in *rufus*, against the darker thorax with nearly black stripes and spots and the narrow hypopygium (narrower than the last segment) of *rufiventris*.

Unfortunately, no mention is made of the latter character in Williston's original description which fits, as far as it goes, the specimens which I had noted as *rufus*.

In August 1925, I collected a species of *Proctacanthus* in the sandy areas along the Rio Grande near Albuquerque, N. Mexico. These specimens agreed with Hine's description of *rufus*, and differed as noted from the New England specimens. Since then I have examined a number of collections from states on the Atlantic Coast from South Carolina north to Maine and have found plenty of specimens of what Hine describes as *rufiventris*, but none from this region of what he describes as *rufus*. Now Williston's specimens were from Masaschusetts and North

Carolina, and—as the specimens taken in these regions fit his description—it is very probable that it was this species with which he was dealing. The name *rufus* should, therefore, be applied to the eastern species with the dark thorax and narrow hypopygium. The western species (which, however, comes as far east as Ohio and Kentucky) with the uniform light red thorax and enlarged hypopygium is a new species. I should note that this designation of "Eastern" and "Western" species is more or less arbitrary. I have seen specimens of Williston's *rufus* from Oklahoma.

I am, therefore, proposing a new name for Hine's *P. rufus.* I take pleasure in naming this species *Proctacanthus hinei* in honor of this worker who has contributed so much to the knowledge of this interesting family of flies in this country.

Proctacanthus hinei new species.

♂ Total length 33 mm. Dull reddish species with genitalia from above wider than last abdominal segment. Antennæ reddish with black bristles. Facial gibbosity prominent, dull red. Proboscis upturned at tip; black above, red beneath. All hairs of head (mystax, beard, palpal hairs) white, some with faint yellowish tinge, particularly in mystax. A few black bristles on vertex and occiput. Thorax and legs dull reddish. Legs with black bristles and spines. Mass of white hairs on anterior part of pro-coxa. Bristles of scutellum and posterior dorsum of thorax black. Fine hairs on anterior dorsum of thorax also black. Pleuræ with fine whitish bloom. A few black bristles on meso—and meta—coxæ. Tuft of hairs in front of halteres pale yellowish. Wings nearly clear with light, reddish veins. Abdomen yellowish-red, except first tergite and anterior half of second which are very dark red—practically black. Anterior four or five incisures darker than rest of abdomen. Sides and venter of anterior portion of abdomen with thin, white pile. A few black hairs on sides of first tergite. Genitalia yellowish-red with fine hairs, some black, some pale yellowish. Genitalia wider than last abdominal segment, the appendages from dorsal view wide at base, narrowing toward apex.

Holotype ♂ Albuquerque, N. Mexico. Aug. 3, 1925. In Coll. S. W. Bromley.

I have never seen a specimen of the true *P. rufiventris* Macq. from the United States. The species was originally described from San Domingo, but the description is very meagre and might very well apply to Williston's *rufus*. I have seen, however, specimens of what I take to be *rufiventris* from Haiti, the Dominican Republic, Cuba, and the Bahamas, and it is quite different from any species I have seen from the United States, being more closely related to *P. fulviventris* Macq. from Florida than to *P. rufus*. The principal points of difference distinguishing it from the latter are the yellow hairs on the scutellum (in *rufus* they are black), the thick yellow pile along the sides of the abdomen near its base, the general golden color of the thoracic vestiture, and the smaller average size. The black markings on the thorax are also very decided, contrasting with the general reddish color of the thorax. *Fulviventris* Macq. has the femora black. In the present species they are red.

Macquart's name *rufiventris*, however, can not stand, as the same species was, beyond the slightest doubt, described from San Domingo by Olivier in 1789 (Encyclop. Methodique IV, 263.4) as *Asilus vittatus*. Macquart's description of *rufiventris* in Dipteres Exotiques (I, 2, 123), appeared in 1838. E. Lynch—Arribalzaga described a species of *Proctacanthus* from Misiones, giving it the name of *vittatus* in 1880, (Annal. Soc. Cient. Argent., IX. 261. 29), but I have not seen the description of this species.

In recapitulation, therefore, we have the following established species and synonymy.

1. **Proctacanthus vittatus** Olivier.
   Syn: *Proctacanthus rufiventris* Macquart.
2. **Proctacanthus rufus** Williston.
   Syn: *Proctacanthus rufiventris* Hine.
3. **Proctacanthus hinei** new species.
   Syn: *Proctacanthus rufus* Hine.

In studying a number of Asilidæ from the Cornell University collection, kindly loaned me through the good offices of Drs. Johannsen and Bradley, I came across an interesting new species of *Proctacanthus* from Southern Georgia, related to *P. brevipennis*

Wied. but lighter in color and averaging larger. The abdomen is comparatively longer and the femora are uniformly reddish. The proboscis is longer and more slender than in *brevipennis* and the palpal hairs are all white.

Proctacanthus gracilis new species.

Total length, 26-30 mm. ♂ Proboscis slender, black. Palpi black. Hairs of palpi mystax, beard and post-genæ nearly white with very pale yellowish tinge. Antennæ dark reddish, second segment lightest. Occipital bristles and a few on vertex black. Frons light yellowish pruinose. Thorax reddish in ground color, with dark red median line and lateral vittæ and covered, except the median line and vittæ, with pale yellowish bloom. Coxal hairs and tuft in front of halteres pale yellow. Pronotal bristles, bristles on posterior part of mesonotum and scutellum black. Legs reddish with black bristles and fine pale hairs, the tarsi darker in color. Wings nearly hyaline with faint reddish tinge. Veins reddish. Ground color of abdomen reddish, but covered with pale yellowish bloom and fine pubescence. Side bristles on first abdominal segment black. There is an obscure brownish area in the center of each segment forming a broken median line along the dorsum of the abdomen.

♀ Same as male, but with blackish ovipositor with circlet of black spines.

Holotype ♂. Spring Creek, Decatur County, Ga. July 16-19, 1912. Cornell U. lot 482 sub. 132. Coll. J. C. Bradley. Allotopotype ♀, same date, lot and sub. 12 paratypes. All topotypes but two. Of the latter, one bears the label "Georgia," and the other "Billy's Island, Okefenokee Swamp, Ga., June 1912."

THE MUTILLIDAE OF CUBA (HYM.).[1]

By Clarence E. Mickel,
The University of Minnesota.

Mutillidæ from Cuba are apparently very rare in collections. The largest collection, on which notes have been published, comprises the material belonging to this family in the Gundlach collection of Hymenoptera. The total number of specimens of Mutillidæ in that collection was nine, representing five species and three genera. The specimens were recorded and described by Cresson (1865), and at that time included all the species known from Cuba. Two additional species from Cuba have been described since by Blake (1871) and Mickel (1926).

Dr. George Salt succeeded in collecting a number of Mutillidæ in 1925 in the vicinity of the Harvard Biological Station at Soledad, Cuba. His collection includes the greatest number of specimens from the island of Cuba which has so far been made available for study. Dr. Salt very courteously offered me the opportunity of examining and studying this material for which I take this occasion to express my sincere appreciation.

There are thirty-five specimens in the Mutillid material collected by Dr. Salt, representing six species and four genera. The genus *Pseudomethoca* which was heretofore unknown from Cuba is represented in the material by a new species. The identity of *senex* Guérin and *palliceps* Cresson as two sexes of the same species which had been suggested by André (1898) is verified by Dr. Salt's collecting. Two new species of the genus *Ephuta* were also found in the material. In addition to the records and descriptions of the species in the Salt collection, I have included complete synonymical notes on all the species known from Cuba. I have appended also a list of the Mutillidæ known to occur in the West Indies exclusive of Cuba, in order to make readily accessible in one paper a complete catalogue of the Mutillid fauna of the West Indian Islands. None of the species known from Cuba have been recorded from the other islands.

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[1] Published with the approval of the Director as Paper No. 694, of the Journal Series of the Minnesota Agricultural Experiment Station.

Genus **Pseudomethoca** Ashmead.

1. **Pseudomethoca salti** n. sp.

Female. Head broader than the thorax, pale ferruginous, densely clothed with appressed, brilliant ochraceous pubescence; thorax blackish; abdomen ferruginous; pygidium granulate. Length, 8 mm.

Head pale ferruginous, densely clothed throughout with appressed, brilliant ochraceous pubescence; mandibles ferruginous, black at the tips, edentate; anterior margin of the clypeus with a prominent tooth each side at a point about one-fourth the width of the clypeus from the base of the mandibles; medio-anterior area of clypeus glabrous, impunctate; antennal tubercles separated by about half the length of the scape; scape ferruginous, glabrous, indistinctly punctate, with scattering, long, erect, pale hairs; first segment of flagellum longer than the second, but not as long as two and three united; antennal scrobes distinctly carinate above; puncturation of front and vertex obscured by the pubescence; genæ closely, distinctly punctate, the pubescence sparse; posterior margin of the genæ prominently carinate, the carina extending to the postero-lateral angles; relative widths of head and thorax, 6—5.2.

Thorax hexagonal, strongly constricted behind the middle, very dark mahogany red, almost black, clothed above with sparse, inconspicuous, dark pubescence; dorsum of thorax densely and deeply punctate; scutellar scale absent; propleura closely punctate, a carina extending ventrally from the humeral angles; mesopleura, metapleura and sides of propodeum glabrous, impunctate; anterior half of mesopleura with sparse, fine, pale pubescence; upper part of posterior face of propodeum coarsely punctato-reticulate, the ventral half with large, close punctures.

Abdomen ferruginous; first segment completely sessile with the second; disk of first tergite with intermixed large and fine punctures, the posterior third with large, deep, dense punctures; posterior margin of first tergite with a fringe of dark ferruginous pubescence; second tergite ferruginous, the areas at the basal lateral angles very dark ferruginous, almost black; basal two-thirds of second tergite densely and deeply rugoso-reticulate, apical third with dense, moderate punctures; sides and disk of second tergite clothed with sparse, pale pubescence; apical third of second tergite, except at the sides, clothed with sparse, long, black pubescence; tergites 3-5 densely, finely punctured, clothed with dense, appressed, brilliant ochraceous pubescence; a very small, inconspicuous spot of black pubescence medially on the apical margins of tergites 3 and 4; ultimate tergite with brilliant ochraceous pubescence basally; pygidial area distinct and granulated; first sternite with a median, longitudinal carina; second sternite with large, distinct punctures throughout; apical margins of sternites 3-6 densely punctured; all the sternites clothed with very sparse, pale pubescence.

Legs ferruginous, sparsely clothed with pale pubescence; calcaria pale.

Holotype: ♀, Soledad, Cuba, February 9, 1925 (George Salt), in collection of Museum of Comparative Zoölogy, Cambridge, Mass.

This species appears to be somewhat similar to *flaviceps* André described from Haiti but differs in the thorax being dark throughout, the absence of pubescent spots on the pleura, the ferruginous abdomen, first abdominal tergite without a median spot of silvery pubescence on the posterior margin, second abdominal tergite without three dark red spots, and in other minor characters. I am pleased to name this species for Dr. George Salt, through whose kindness I have been able to study this collection of Cuban Mutillids.

Genus **Dasymutilla** Ashmead.

2. **Dasymutilla nigriceps** (Cresson).

1865. *Mutilla nigriceps* Cresson, Proc. Ent. Soc. Phila., **4**: 110, ♀.

1871. *Mutilla* (*Sphærophthalma*) *nigriceps* Blake, Trans. Amer. Ent. Soc., **3**: 245, ♀.

1886. *Sphærophthalma nigriceps* Blake, Trans. Amer. Ent. Soc., **13**: 238, ♀.

1897. *Mutilla fiorentinii* Dalle Torre, Cat. Hymen., **8**:40, ♀.

1898. *Mutilla* (*Ephuta*) *nigriceps* André, Ann. soc. ent. France, **67**: 53, ♀.

1900. *Mutilla nigriceps* Fox, Ent. News, **11**: 401, ♀.

1903. *Ephuta* (*Ephuta*) *nigriceps* André, Gen. Ins., **1** (fasc. 1): 62, ♀.

Type: ♀, Cuba, in collection of American Entomological Society of Philadelphia.

Specimens examined:

♀, Soledad, Cuba, February 22, 1925 (J. G. M.); ♀, Soledad, Cuba, March 18, 1925 (George Salt); ♀, Soledad, Cuba, April 1, 1925 (George Salt); ♀, Soledad, Cuba, May 28, 1925 (George Salt); ♀, Soledad, Cuba, June 9, 1925 (George Salt); ♀, Soledad, Cuba, December 3, 1927 (J. W. Wilson); ♀, Soledad, Cuba, December 6, 1927 (W. S. Creighton).

3. **Dasymutilla wilsoni** (Cresson).

1865. *Mutilla Wilsoni* Cresson, Proc. Ent. Soc. Phila., **4**: 112, ♂.

1871. *Mutilla* (*Sphærophthalma*) *Wilsoni* Blake, Trans. Amer. Ent. Soc., **3**: 240, ♂.

1886. *Sphærophthalma Wilsoni* Blake, Trans. Amer. Ent. Soc., **13**: 232, ♂.

1897. *Mutilla wilsonii* Dalle Torre, Cat. Hymen., **8**: 98, ♂.

1900. *Mutilla Wilsoni* Fox, Ent. News, **11**: 401, ♂.

1903. *Ephuta* (*Ephuta*) *Wilsoni* André, Gen. Ins., **1** (Fasc. 11): 65, ♂.

Type: ♂, Cuba, in collection of American Entomological Society of Philadelphia.

Specimens examined:

♂, Soledad, Cuba, February 16, 1925 (J. G. Myers); ♂, Soledad, Cienfuegos, Cuba, Jan.-Feb., 1927 (C.T. and B. B. Brues).

This may possibly be the male of *nigriceps* Cresson.

4. **Dasymutilla insulana** Mickel

1926. *Dasymutilla insulana* Mickel, Ent. Mitt., **15**: 197, ♀.

Type: ♀, Guantanamo, Cuba, in Deutches Entomologisches Institut, Berlin-Dahlem, Germany.

Specimens examined:

Two females from Guantanamo, Cuba, in addition to the type.

Superficially this species resembles *nigriceps* Cresson, but is very different as pointed out in the original description. It is probably more nearly related to *bouvieri* André described from San Domingo.

Genus **Timulla** Ashmead.

5. **Timulla senex** (Guérin).

1844. *Mutilla senex* Guérin, Iconogr. regn. anim., **7**: 429, Pl. 69, fig. 4, ♂.

1857. *Mutilla senex* Lucas, Ramon: Hist. fis. Cuba, **7**: 758.

1865. *Mutilla senex* Cresson, Proc. Ent. Soc. Phila., **4**:110, ♂.

1865. *Mutilla palliceps* Cresson, Proc. Ent. Soc. Phila., **4**: 112, ♀.

1871. *Mutilla senex* Blake, Trans. Amer. Ent. Soc., **3**: 230, ♂.

1871. *Mutilla palliceps* Blake, Trans. Amer. Ent. Soc., **3**: 230, ♀.

1879. *Mutilla senex* Girard, Traité elem. d'entom., **2**: 994, Pl. 75, fig. 4, ♂.

1886. *Mutilla senex* Blake, Trans. Amer. Ent. Soc., **13**: 199 ♂.

1886. *Mutilla palliceps* Blake, Trans. Amer. Ent. Soc., **13**: 200, ♀.

1897. *Mutilla pallidiceps* Dalle Torre, Cat. Hymen., **8**: 70, ♀.

1897. *Mutilla senex* Dalle Torre, Cat. Hymen., **8**: 85, ♂.
1898. *Mutilla senex* André, Ann. soc. ent. France, **67**: 38, ♂, ♀.
1900. *Mutilla palliceps* Fox, Ent. News, **11**: 401, ♀.
1903. *Mutilla senex* André, Gen. Ins., **1** (fasc. 11): 42, ♂.

Type: ♂, Cuba, in the Museum of Paris.

Type of *palliceps* in collection of American Entomological Society of Philadelphia.

Specimens examined:

2♂, 2♀, Soledad, Cuba, February 7, 1925 (George Salt); 14♂, Soledad, Cuba, February 16, 1925 (George Salt); 2♂, Soledad, Cuba, February 21, 1925 (George Salt); ♂, Soledad, Cuba, March 2, 1925 (George Salt); 2♂, Soledad, Cuba, March 4, 1925 (George Salt); ♀, Soledad, Cuba, June 1, 1925 (George Salt); ♀, Soledad, Cienfuegos, Cuba, October 24, 1926 (Darlington); 2♀, Soleland, Cienfuegos, Cuba. November 7, 1926 (Darlington).

Blake (1871) first suggested that *palliceps* was probably the female sex of *senex* Guérin. Later André (1898) united the two as sexes of the same species, although the evidence was not absolutely conclusive. In the material collected by Dr. Salt there is a male specimen and a female specimen pinned on the same pin, which apparently indicates that they were taken *in copula*. Since these are the only two members of the genus *Timulla* described from Cuba the evidence seems to justify the uniting of *palliceps* Cresson with *senex* Guérin as the two sexes of *senex*.

Genus **Ephuta** Say.

6. **Ephuta rubriceps** (Cresson).

1865. *Mutilla rubriceps* Cresson, Proc. Ent. Soc. Phila., **4**: 111, ♀.
1871. *Mutilla rubriceps* Blake, Trans. Amer. Ent. Soc., **3**: 257, ♀.

1886. *Sphœrophthalma rubriceps* Blake, Trans. Amer. Ent. Soc., **13**: 216, ♀.

1897. *Mutilla rubriceps* Dalle Torre, Cat. Hymen., **8**: 79, ♀.

1900. *Mutilla rubriceps* Fox, Ent. News, **11**: 401, ♀.

1903. *Ephuta* (*Ephuta*) *rubriceps* André, Gen. Ins., **1** (fasc. 11): 63, ♀.

Type: ♀, Cuba, in Gundlach collection, Instituto de Segunda Ensenanza de la Habana, Obispo street, Havana, Cuba.

Known only from the type specimen. This species has always been placed with the group of species which now form the genus *Dasymutilla* Ashmead. It seems perfectly evident from Cresson's description of the first abdominal segment that it really belongs to the genus *Ephuta*. From the original description it appears to be very closely related to *cubensis* Blake.

7. **Ephuta cubensis** (Blake).

1871. *Mutilla cubensis* Blake, Trans. Amer. Ent. Soc., **3**: 231, ♀.

1886. *Mutilla cubensis* Blake, Trans. Amer. Ent. Soc., **13**: 202, ♀.

1897. *Mutilla cubensis* Dalle Torre, Cat. Hymen., **8**: 29, ♀.

1900. *Mutilla cubensis* Fox, Ent. News, **11**: 401, ♀.

1903. *Rhoptromutilla cubensis* André, Gen. Ins., **1** (fasc. 11): 44, ♀.

Type: ♀, Cuba, in collection of American Entomological Society of Philadelphia.

Known only from the type specimen.

8. **Ephuta festata** n. sp.

Female. Very dark ferruginous, deeply, foveately punctate;

head slightly wider than the thorax, clothed with dense, appressed, ochraceous pubescence; thorax subrectangular, bituberculate on each side; abdomen maculated with areas of appressed, black and ochraceous pubescence. Length, 9.5 mm.

Head ferruginous, densely clothed with appressed, ochraceous pubescence and sparse, erect, ochraceous hairs; mandibles ferruginous, black at the tips, edentate; clypeus very broadly and prominently elevated into a process medially, the ventral surface of the process strongly concave, densely punctured and clothed with erect, ochraceous pubescence; the dorsal surface of the process coarsely punctured, with sparse, erect, ochraceous pubescence, and medially elevated into a blunt tooth; scape, pedicel and first segment of flagellum ferruginous, the remainder of the flagellum darker; scape glabrous, with scattered punctures above; flagellar segments 3-9 planate beneath; antennal scrobes not carinate above; front and vertex with sparse, deep,distinct punctures, the intervals between the latter with fine, dense, shallow punctures; genæ with large, rather close very deep punctures, the intervals between the latter sculptured like the front, posterior margin of the genæ defined by a prominent crenulate carina which terminates at the postero-lateral angles; relative widths of head and thorax, 3.75-3.25.

Thorax subrectangular, ferruginous, the dorsum and pleura densely, foveately punctate, the punctures of the pleura larger and more separated than those of the dorsum; dorsum of thorax and posterior face of propodeum clothed with sparse, erect, black pubescence; mesopleura and metapleura and ventral margins of propodeum clothed with appressed, ochraceous pubescence; thorax tuberculate at the postero-lateral angles of the pronotum, and at the propodeal spiracles, the latter opening on the posterior surface of the tubercle.

Abdomen ferruginous; first segment quadrate, the anterolateral angles dentate; first tergite with close, deep punctures, clothed with dense, appressed, ochraceous pubescence and sparse, erect, ochraceous hairs, the posterior margin with a small spot of black pubescence medially; second tergite, except broad apical margin, with deep foveate punctures, dense and confluent on the disk, larger and somewhat separated at the base and sides, the intervals between the punctures feebly granulate; the broad apical margin depressed, with only scattered, large punctures; second tergite with a large, median, basal spot, and median, apical spot of dense, appressed black pubescence, the basal spot margined basally and laterally with dense, appressed, ochraceous pubescence, the apical spot broadly interrupting a broad apical band of dense, appressed ochraceous pubescence, the latter narrowed laterally and extended anteriorly along the lateral margins of the tergite to the anterior angles; basal half of third tergite densely foveately punctate, the apical half finely, shallowly punctate with scattered, large punctures; broad, lateral margins of third tergite with dense, appressed, ochraceous pubescence, the apical half of the tergite (except lateral margins) clothed with dense, appressed, black pubescence, narrowly interrupted medially with a line of dense, appressed, ochraceous pubescence; fourth tergite like the third, except the black band is broadly interrupted by a spot of dense, appressed, ochraceous pubescence; fifth tergite clothed entirely with dense, appressed, ochraceous pubescence, except for a pair of obscure, small, lateral spots of black, appressed pubescence; ultimate tergite densely punctured, clothed with rather dense, erect, ochraceous pubescence, pygidial area punctate and pubescent; first sternite with a prominent, median, longitudinal carina; second sternite with large, elongate, contiguous punctures; apical margins of sternites 3-5 densely punctate; apical margins of sternites 2-3 with a band of dense, appressed, ochraceous pubescence, the remainder of the venter clothed with sparse, erect, pale pubescence.

Legs ferruginous; femora beneath finely and closely punctured on the apical half and clothed with fine, appressed, pale pubescence; remainder of legs clothed with sparse, erect, pale pubescence; calcaria pale.

Holotype: ♀, Soledad, Cuba, May 6, 1925 (George Salt), in collection of Museum of Comparative Zoölogy, Cambridge, Mass.

Paratypes: ♀, Soledad, Cuba, April 26, 1925 (George Salt), in collection of University of Minnesota; ♀, Soledad, Cienfuegos, Cuba, November 9, 1926 (Darlington).

Related to *rubriceps* Cresson and *cubensis* Blake. *Festata* differs from *rubriceps* in having the thorax and legs ferruginous, and in the pubescent ornamentation of the thorax and abdomen; it differs from *cubensis* in the pubescent ornamentation of the abdomen.

9. **Ephuta furcillata** n. sp.

Male. Entirely black, coarsely punctured; head, prothorax, mesopleura, dorsum of propodeum, first abdominal tergite, apical margin of second tergite and apical margin of second sternite clothed with dense, appressed, silky white pubescence; scutellum prominently bifurcate; propodeum with a pair of tubercles at the antero-lateral angles and a pair of prominent teeth a short distance posterior to the tubercles; abdominal tergites 3-7 with a median, longitudinal carina; wings hyaline, the apical border very broadly fumose. Length, 8 mm.

Head black, clothed with dense, appressed, silky white pubescence; mandibles ferruginous, black at the tips, acute at the apex and with a single tooth within; clypeus with a pair of carinæ originating just anterior of the antennal tubercles, parallel on the basal half, strongly diverging on the apical half, thus enclosing a space within the arms of a Y, the enclosed space glabrous, finely, sparsely punctate; remainder of clypeus densely clothed with appressed, silky white pubescence; scape slightly concave and bicarinate beneath, above finely and closely punctured; first segment of flagellum almost equal in length to the second; antennal scrobes carinate above; front and vertex with moderate, scattered punctures, the intervals between the punctures finely granulate; genæ coarsely, deeply punctured, the posterior margin defined by a prominent, slightly crenulate carina; relative widths of head and thorax, 3-3.6.

Thorax black; pronotum and propleura densely, closely, foveately punctate, the propleura less so than the pronotum, the whole clothed with appressed and erect, silky white pubescence, not as dense as on the head; mesonotum glabrous, with sparse, large punctures, the anterior margin and the postero-lateral angles clothed with dense, appressed, silky white pubescence, remainder of mesonotum almost bare; scutellum bifurcate, the teeth projecting posteriorly, coarsely punctate, the small antero-lateral areas clothed with dense, appressed, silky white pubescence; metanotum clothed with conspicuous, silky white pubescence; mesopleura coarsely, deeply punctate, clothed with dense, appressed, silky white pubescence; metapleura glabrous, sparsely clothed with pale pubescence; sides of propodeum glabrous with very large, distinct punctures, almost bare; dorsum of propodeum densely clothed with appressed, silky white pubescence, the postero-lateral angles produced into a prominent tooth, the antero-lateral angles with a small tubercle, on the posterior surface of which is the propodeal spiracle; posterior face of propodeum deeply reticulate, almost bare; tegulæ very large, conchatiform, punctured throughout with sparse, fine punctures, and clothed with very sparse, pale pubescence.

Abdomen black; first segment quadrate; first tergite with the antero-lateral angles strongly dentate, densely clothed with appressed, silky white pubescence; second tergite with large, elongate, more or less contiguous punctures, clothed with very sparse, erect, pale pubescence, except the apical margin with a broad band of dense, appressed, silky white pubescence; tergites 3-7 with a median, longitudinal carina, with sparse, moderate punctures, and clothed with sparse, erect, pale pubescence, except tergites 3 and 4 with a spot of dense, appressed, silky white pubescence at the lateral margins; first sternite with a median, longitudinal carina, the latter produced anteriorly into a prominent tooth; second sternite with large, close punctures, clothed with sparse, erect, pale pubescence, except the apical margin with a band of dense, appressed, silky white pubescence; sternites 3-7 with small, sparse punctures, and clothed with sparse, erect, pale pubescence.

Wings hyaline, except cell $C+Sc_1$ and the apex of the wing beyond cells 2nd R_1+R_2 and R_4, fumose; cell R_4 present; vein M_{3+4} received by cell R_5 about three-fifths the distance from the base to the apex; vein M_2 received by cell R_4 almost at the apex; veins r—m and R_5 widely separated on vein r.

Legs black, clothed with sparse, silky white pubescence; calcaria white.

Holotype: ♂, Soledad, Cuba, April 9, 1925 (J. G. Myers), in collection of Museum of Comparative Zoölogy, Cambridge, Mass.

Paratype: ♂, Soledad, Cuba, February 21, 1925 (George Salt), in collection of University of Minnesota.

This is the only male of this genus thus far described from the West Indies. It will probably prove to be the male of *festata.*

Mutillidæ described from the West Indies, exclusive of Cuba.

1. *Pseudomethoca flaviceps* André. Haiti.
   Zeit. f. Hymen. u. Dipt., **6**: 72-74, ♀. 1906.
2. *Pseudomethoca unicincta* Ashmead. St. Vincent Islands.
   Trans. Ent. Soc. London, **1900**: 239, ♀. ♂. 1900.
3. *Dasymutilla bouvieri* André. San Domingo.
   Ann. soc. ent. France, **67**: 51, ♀. 1898.
4. *Dasymutilla militaris* Smith. Jamaica.
   Cat. Hymen. Brit. Mus., **3**: 61, ♀. 1855.
5. *Dasymutilla melancholica* Smith. San Domingo.
   Descr. New Species of Hymen., 223, ♀. 1879.
6. *Dasymutilla cargilli* Cockerell. Jamaica.
   Psyche, **7** (suppl.): 16, ♀. 1895.

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AN INTRODUCED MOTH (*HELIOTHIS DIPSACEA L.*)

By Fred H. Walker,
Salem, Mass.

While looking over the Clark collection of Lepidoptera recently acquired by the Boston Society of Natural History, my attention was attracted to a single moth bearing the label "*Heliothis dipsacea* L. Europe." A close examination of the moth showed it to be similar to specimens in the author's collection of Essex County, Massachusetts, insects. Fortunately, two specimens from Essex County which had been given to the Boston Society's New England collection were conveniently available for comparison; this proved that all were undoubtedly of the same species. Through the courtesy of Mr. Nathan Banks, European specimens in the collection of the Museum of Comparative Zoölogy were examined and the identification confirmed.

With the assistance of Mr. C. W. Johnson of the Boston Society and Mr. A. P. Morse of the Peabody Museum at Salem, European literature was consulted, some disagreement as to larval characters being noted. Most of the food plants recorded are either adventive or naturalized in this country and the introduction of the moth was probably coincident with the introduction of some of the food plants; these include toadflax, teasel, hawkweed, hawk's beard and species of dock and plantain. Some of the food plants are now widely distributed throughout the northeastern United States and it would be interesting to know more about the distribution of the moth in this country with an accurate description of the larva and its habits. In Europe the species is recorded as being widely distributed but not common and it is apparently of little economic importance. Localities are given as central and southern Europe and Asia, northern Africa, Canary Islands and one author (Meyrick) includes "N. America.?"

The moth appears to be rare in the vicinity of Salem, only eight specimens having been taken by the author during six years of collecting; it has been seen but not taken several times, its unusual appearance making it easily recognized. It (the male moth) flies both by day and night, captures having been made with net in daytime and with trap-light at night.

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Phalæna Noctua dipsacea Linné, Systema Naturæ, ed. 12, tome, 1 pars 5, p. 2553.

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Heliothis dipsacea Scorer, Entomologist's Log Book, 1913, p. 98.

Description:—Fore wings light brown, darker at inner marginal area; dark brown bar extends across middle of wing blending broadly with dark area at inner margin; narrow dark band at outer submarginal area; dark spot on costal margin near apex; numerous fine black dots are scattered over the wing converging thickly at discal cell forming a small dark area, with a single row at outer margin and an irregular row across the limbal area. Hind wings light buff with a broad black marginal band in the middle of which there are two closely contiguous pale spots divided by vein M2, these two spots in some instances are merged into one bilobed spot; large black discal spot extending nearly to costal margin; marginal fringe whitish. Under side of wings whitish buff with black discal spots, two on fore wing and one on hind wing; irregular narrow black band extends across both wings in limbal area.

Wing expanse, 30 to 35 mm.

Described from six males taken by the author in Essex County, Massachusetts, May 31-June 16, 1916, 1919, 1921.

UNUSUAL OCCURRENCE OF GYRINUS.

By C. A. Frost,
Framingham, Mass.

My first specimens of Coleoptera collected in 1928 were taken about 1 P. M. on January 15, and, incidentally, their appearance indicates the unusual weather condition of the winter to date.

While walking around Farm Pond in Framingham I noticed a few Gyrinus resting or slowly swimming about near the shore. The pond had been covered with ice about six inches thick but the mild weather had melted large holes in it and along the shore the open water varied from two to twenty feet in width; the upper end of the pond was open over several acres. The only snow storm of account came on December 5th and deposited about two inches which soon vanished.

Where the Gyrinus were observed several large limbs had fallen into the water and in a crotch of the branches was a partly submerged mass of leaves and pond weeds. On disturbing this, two hundred or more beetles appeared. They swam about over the pebbles of the bottom where the water was from two to eight inches deep, and under the submerged limbs or clung to bits of the submerged pond weeds. Many of them came to the surface and played about a short time while a few scurried out into the pond several yards and remained up to the time I left half an hour later.

I took 36 specimens in my hand and these were very kindly determined by my friend Mr. K. F. Chamberlain, Assistant to the State Entomologist of New York, as *G. confinis* Lec., 17 males and 19 females.

The sky was generally cloudy with the sun occasionally peeping out while a cool north wind was blowing. The temperature of the air was 38° F. and the water in a neighboring reservoir was 35° F. at 7 A. M. the next morning.

As a further illustration of the abnormal season, I found on the under side of a bit of board near the shore two species of

Collembola, one spider, four yellowish cut-worm like larvæ, one Stenus and several specimens of an *Aleocharinid* beetle. The appearance of insects on the under side of sticks and stones does not normally occur much before April.

THE PROTOCOLEOPTERA.

By Wm. T. M. Forbes,
Cornell University, Ithaca, New York.

Tillyard (Proc. Linn. Soc. N. S. W. vol. 49 p. 429, 1924) proposed an order with this name, based on a fore wing from the Permian of Australia. The present note intends to show that the form there described has no distinctive characters of the Coleoptera, but is more probably to be credited to the Orthoptera, with the possibility that it may be nearer to the ancestor of the Hemiptera.

The fossil (fig. 1) is a fore wing of characteristic Coleopterous form, except in one extremely important point, the presence of a deep notch at the articulation, and a basally extended anal lobe. This is a common feature of the Orthoptera, being more or less obvious in all the families, even in the cockroaches; and is correlated with a depression or fold at the base of the wing, which tends to bury the roots of veins M and Cu (Crampton '27). In the Coleoptera there is no such fold, but the articulation of the elytron is direct, and the veins (except Sc) all start out more or less on a level.

Secondly, the venation is rich in branches of main veins, with a few obliquely directed cross-veins. This is a common Orthopterous condition, though as a rule the supply of cross-veins is also rich. Fig. 2 shows the fore wing of a Gryllacridid, with the basal notch (in this form open and filled by a triangular group of sclerites), several precostal veins, Sc and R branched, the latter richly, M and Cu branched, their branches anastomosing, but entirely free from the veins above and below; an ambilent vein, which passes over the end of the anal fold (Pl) without change of character, and several axillary (anal) veins, starting separately from the basal notch. This form does not show the oblique cross-veins, but they are obvious in many crickets, at least on the dorsal part of the wing. In the form figured (*Eneoptera surinamensis*) the venation is richer than in Protocoleus, but the general character is plainly the same. In other forms (Gryllinæ etc.) the veins are even more regular than in Protocoleus. The other characters are common to the Gryllacrididæ and Protocoleus, though the whole is distorted to form a functional elytron and the breadth of the veinless margin is exaggerated. Even in the wing as preserved there is a well-veined precostal region,

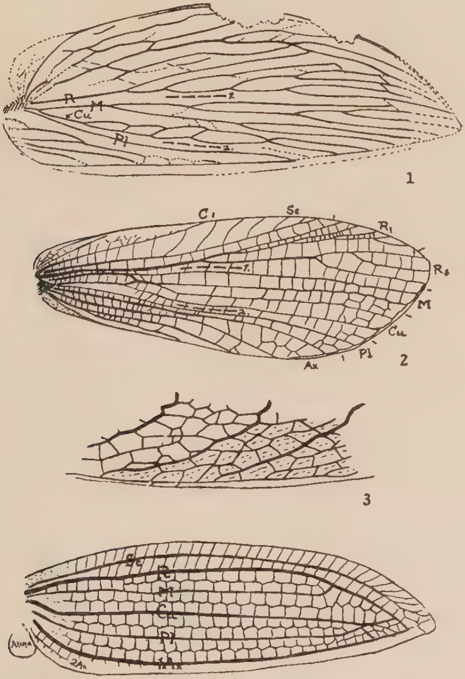

Fig. 1. 1, *Protocoleus*,, mainly after Tillard's photograph, (Pl. 46), supplemented by his restoration (fig. 3, p. 432); 2, *Gryllacris* (Orthoptera, Gryllacrididæ); fore wing; 3, *Eneoptera surinamensis* (Orthoptera, Gryllidæ); portion of inner margin of fore wing; 4, Venation of Coleopterous elytron, synthesized mainly from venation of Cupes and tracheation of Tenebrio.

and the photograph seems to leave a possibility that some has been lost, as indicated by dotted lines in the figure; M and Cu are well bound by cross-veins, though not actually anastomosing, and the veinless paths separating them from R and the anal system are striking,—the most distinctive feature of the wing.

On the other hand the Coleoptera, as shown by the forms that have veins on the elytron (fig. 4) have unbranched veins, with regularly arranged cross-veins forming double rows of cells between them; and M and Cu noticeably avoid each other, each tending to fuse with its other neighbor in the outer part of the wing,—a very distinctive wing.

In summary,—A: *Resemblances of Protocoleus to Orthoptera* and partly to Hemiptera:

1, Precostals present

2, Main veins richly branched

3, Cross-veins few, and oblique

4, Anal lobe extended basally

5, M associated with Cu, R and anals independent

6, Plical vein (the one lying in the fold) running to inner margin, as in cockroaches and Hemiptera

B: *Characters typical of the Coleoptera* (but shared by Diploptera in the Orthoptera s. l.)

1, Inner margin straight, the elytra no doubt meeting in the middle of the back

2, Apex pointed (Tillyard in lit.) and located at M rather than R.

C: *Characters of the Coleoptera not shared by Protocoleus*:

1, Costa marginal (also some Orthoptera, but not universal)

2, All veins simple (the prototype no doubt with *terminal* branching)

3, Cross-veins numerous, two-ranked and transverse

4, Base of wing simple, the anal veins when traceable run directly into the articulation

5, M running into R, Cu into the plical vein.

6, Plical vein running to apex.

I then formally refer Protocoleus to the *Orthoptera*, where it will form a well characterized family related to the Gryllacrididæ, distinguished mainly by the elytriform fore wing with apex at Media.

NOTE: In view of the uncertainty prevailing as to the homology of the anal veins in the various orders of insects, I hereby propose the term *Plical* (Pl) to designate, without any implication of homology, a vein or veins closely associated with the anal fold, and more or less set off from the cubitus and from the other anals. For the latter (excluding the plical or plicals) the term *Axillary*, already in use in this sense in the Lepidoptera and Orthoptera, may be used, restricting that term, then, to anals associated with the anal fan rather than the fold. The maximum number of plical veins will be *three* (hind wing of Blattoidea and Mastotermes), one of them being in that case free, one supplied by a trachea coming off the anal fan, and the third sometimes with a free trachea, but more often supplied from the base of the cubital trachea. In higher forms there will be in general one Plical, but it is not clear to which of the three in the Blattoidea (if any) it corresponds.

TABLE OF THE NORTH AMERICAN SPECIES OF MEDETERUS, WITH DESCRIPTIONS OF THREE NEW FORMS.

By M. C. Van Duzee,
Buffalo, N. Y.

Medeterus longinervis, new species.

Male; 2-2.2 mm. Face black; front brown. Antennæ black, third joint small; artista apical; lower orbital cilia whitish.

Thorax and abdomen black with green reflections; dorsum of thorax more brown with gray pollinose vittæ; the posterior depression reaches the middle of the mesonotum, where the acrostichal bristles end, they are in two rows with a slight coppery vitta between them; one small black bristle above each fore coxa; scutellum with two pair of bristles, the outer pair half as long as the middle ones; hairs of abdomen and hypopygium white; hypopygial appendages brownish yellow.

Coxæ black, anterior pair with pale hairs on front surface and one small black bristle at tip. Femora blackish; tibiæ and tarsi yellowish brown, all their hairs white; middle tibiæ with a small black bristle at basal fourth and posterior pair with one near apical fourth. Joints of hind tarsi as 17-27-14-7-6.

Wings grayish, veins brown; last section of fifth vein 28, of cross-vein 9 fiftieths of a millimeter long.

Type, male, No. 1887, Calif. Acad. Sci., Taken by Edward P. Van Duzee, June 15, 1925, at Olney, Oregon. Two paratypes were taken at the same time and place and are also in the Academy collection.

Medeterus albosetosa, new species.

Male: Length 2 mm. Face and front gray with pollen, which covers the ground color. Antennæ black, the two basal joints more brown, third small, scarcely as long as wide, a little pointed in the middle; arista apical, orbital cilia whitish.

Thorax brown with gray pollen, which leaves narrow brown lines along the rows of bristles; prothorax with two large whitish bristles above each fore coxa; scutellum with two pair of large bristles. Abdomen and hypopygium black with white hair; hypopygial appendages yellowish brown.

Coxæ black, anterior pair nearly bare with black bristles at tips. Femora black with apical third yellow; tibiæ and tarsi yellow, the latter scarcely darker at tip; tibiæ without bristles; joints of fore tarsi as 19-17-10-5-5; of middle pair as 29-21-13-5-6; those of posterior pair as 11-31-12-8-5. Calypters, their cilia and the halteres yellow.

Wings grayish, veins yellow when seen against a dark background; last section of fifth vein 14, cross-vein 10 fiftieths of a millimeter long; venation normal.

Described from one male, taken at Galveston, Texas, in May, by F. J. Snow.

Type in the Kansas University collection.

Medeterus ciliata, new species.

Male; length 3 mm. Face and front black, rather dull, with scarcely a trace of green color. Antennæ wholly black, small; lower orbital cilia brownish yellow.

Thorax and abdomen dark green, a little shining; pollen of thorax dark gray, almost brown; scutellum with two pair of bristles; prothorax with two or three small black bristles above each fore coxa; hairs of the abdomen and legs black; hypopygium and its appendages black.

Coxæ, femora, tibiæ and tarsi black, knees narrowly yellow; fore coxæ with short black hair; fore and middle femora below and posterior pair on anterior surface with long brown hair, some of these hairs being as long as width of femora. Joints of fore tarsi as 15-21-14-5-7; of middle tarsi as 33-17-10-8-5; those of posterior pair as 20-30-14-9-8. Calypters yellow with a black edge and brown cilia; knobs of halteres yellow, their stems brown.

Wings grayish, rather dark; last section of fifth vein 32, cross-vein 16 fiftieths of a millimeter long.

Described from one male taken at Niagara Falls, Ontario, July 17, 1921, by the author.

Type in the author's collection.

Table of North American species of Medeterus.

1 Scutellum with one pair of bristles, there may be a small pair of hairs outside of these 2
Scutellum with two pair of bristles, the outer pair may be small. 12
2 Antennæ, proboscis and legs, including the fore coxæ, yellow, (Virginia). . . . . *novus* Van Duzee.
Antennæ, proboscis and more or less of the femora black. . . . 3
3 Thorax with distinct vittæ. 4
Thorax without distinct vittæ. 10
4 Thorax with a median blue vitta, (New York). . . . . *obesus* Van Duzee.
Thorax with a median brown stripe running its entire length. 5
5 Wings with a brown cloud at base of third vein. 6
Wings without a distinct cloud at base of third vein. 7
6 Tibiæ and tarsi yellow, (California). *cuneiformis* Van Duzee.
Tibiæ brownish; tarsi black with the base of the basitarsus yellowish, (California). Female of *nitidiventris* Van Duzee.
7 Abdomen bluish with gray pollen; front in male produced into a four sided pyramid, (Washington). . . . . *petulcus* Wheeler.
Abdomen shining black, or with green reflections. 8
8 Tibiæ and tarsi mostly yellow, (California). . . . . *similis* Van Duzee.
Tibiæ and tarsi black, green or brown. 9
9 Last section of fifth vein only a little longer than the cross-vein, (California). . . . . *æqualis* Van Duzee.
Last section of fifth vein one and a half times as long as the cross-vein, (California). . . . . *nitidiventris* Van Duzee.
10 Last section of fifth vein only a little more than half as long as the cross-vein, (Alaska). . . . . *minima* Van Duzee.
Last section of fifth vein longer than the cross-vein. 11

11 Femora mostly yellow; mesonotum and abdomen light green. (California)................... *longinquus* Van Duzee.
Femora mostly black; mesonotum coppery; abdomen dark green, (California)................ *aeneus* Van Duzee.
Femora mostly black; mesonotum nearly opaque with gray pollen, so as to appear gray, (California)............. *falcatus* Van Duzee.

12 Bright metallic species...............................13
Darker species, usually blackish, sometimes very dark green...18

13 Anterior tarsi plain...................................14
Fore tarsi modified, ornamented.......................16

14 First joint of hind tarsi only a little shorter than the second; length over 3 mm., (Guatemala)... *planipes* Van Duzee.
Posterior tarsi with the second joint twice as long as first...15

15 Legs altogether black; second joint of hind tarsi more than twice as long as first, (North America).... *nigripes* Loew.
Legs wholly yellow; first and second joints of hind tarsi as 19 to 37, (Eastern)................. *aberrans* Wheeler.

16 Length 2 mm.; male with a lobe on the side of third joint of fore tarsi, (New Jersey; Ontario)...... *lobatus* Van Duzee
Length 3 mm.; fore tarsi otherwise formed.............17

17 Fore tarsi a little widened from base to tip of second joint; third joint only a little narrowed at base, but suddenly narrowed to a slender projection, to which the fourth joint is attached; fourth and fifth joints slender, (Guatemala)............................ *abruptus* Van Duzee.
Fore tarsi with the second and third joints very much compressed and expanded on upper edge; fourth and fifth joints minute, (Guatemala)......... *flavipes* Van Duzee

18 Bristles above fore coxæ black........................19
Bristles above fore coxæ pale, white or yellowish........41

19 Second joint of hind tarsi more than twice as long as first.20
Second joint of fore tarsi twice or less than twice as long as first...21

20 Legs altogether black, (North America)... *nigripes* Loew.
Tibiæ largely yellow, (Eastern)....... *vittatus* Van Duzee.

21 Antennæ wholly black. 22

Antennæ partly yellow.. 30

22 Knobs of halteres blackish. 23

Knobs of halteres yellowish. 24

23 Last section of fifth vein to cross-vein as 9 to 28, (Oregon) *longinervis* Van Duzee, new species.

Last section of fifth vein and cross-vein of about equal length, (Ontario). . . . . *halteralis* Van Duzee. . . .

24 Second joint of hind tarsi slightly more than twice as long as first. 25

Second joint of hind tarsi considerably less than twice as long as first. 26

25 Metallic blue in color, (Illinois). . . . . *cœrulescens* Malloch.

Black in color, (Eastern). . . . . *vitatus* Van Duzee.

26 Hairs of the abdomen black. 27

Hairs on the abdomen pale. 29

27 Second joint of hind tarsi one and a fourth times as long as the first; last section of fifth vein over twice as long as the cross-vein, (Ontario; New York). . . . *frontalis* Van Duzee.

Second joint of hind tarsi one and a half times as long as first. 28

28 Last section of fifth vein only a little longer than the cross-vein, (California). . . . . *obscuripennis* Van Duzee.

Last section of fifth vein twice as long as the cross-vein, (Ontario). . . . . *ciliata* Van Duzee, new species.

29 Second joint of hind tarsi nearly one and three-fourths times as long as first, (Alaska). . . . . *bicolor* Van Duzee.

Second joint of hind tarsi about one and a third times as long as first, (Alaska). . . . . *parvus* Van Duzee.

30 Thorax with distinct gray vittæ. 31

Thorax without distinct vittæ. 33

31 Dorsum of thorax with four gray vittæ (Idaho) *aldrichi* Wheeler.

Dorsum of thorax with a distinct gray stripe each side of the acrostichal bristles. 32

32 Last section of fifth vein one and a half times as long as the cross-vein, (Washington; Alaska). . . . . *viduus* Wheeler...

Last section of fifth vein scarcely longer than the cross-vein, (Washington; Alaska). female of. . . . . . .*viduus* Wheeler..

33 Mesonotum with thick brown pollen. 34

Mesonotum with thin grayish pollen.. 36

34 Fore coxæ almost bare, except a few black bristles at tip; large species, (Ontario; New York).. . . . . *emarginatus* Van Duzee.

Fore coxæ with a row of hairs or bristles on outer anterior edge. 35

35 Hypopygial lamellæ black, (Alaska) *viridifacies* Van Duzee.

Hypopygial lamellæ yellow, (Alberta) *trisetosus* Van Duzee.

36 Last section of fifth vein one and a half times long as the cross vein. 37

Last section of fifth vein not but little longer then the cross vein. 40

37 Cilia of the calypters black, (Illinois). . . *cærulescens* Malloch.

Cilia of the calypters pale. 38

38 Fore coxæ with black hair, (New Hampshire). . . . . *maurus* Wheeler.

Fore coxæ with pale hairs. 39

39 Middle femora with yellowish bristles below; second joint of hind tarsi one and three fourths times as long as the first, (Alaska). . . . .*bicolor* Van Duzee.

Middle femora without yellowish bristles below; second joint of hind tarsi one and a third times as long as first, (Alaska). *parvus* Van Duzee.

40 Hypopygial lamellæ black; second joint of hind tarsi one and three-fourths times as long as first; last section of fifth vein in male three fourths, in female a little more than the length of the cross-vein, (Oregon). . . . . *oregonensis* Van Duzee.

Hypopygial lamellæ yellowish; second joint of hind tarsi one and a half times as long as first; last section of fifth vein and the cross-vein of nearly equal length, (Alberta). male of. . . . .*trisetosus* Van Duzee.

41 Abdomen blue.. 42

Abdomen bronze, green or black. 43

42 Dorsum of thorax with a yellowish vitta; antennæ wholly black, (Idaho). . . . . *aurivittatus* Wheeler.
Dorsum of thorax opaque with gray pollen; first two joints of antennæ yellow, (Washington). . . . *cyanogaster* Wheeler.

43 Males and females. 44
Males only. 53

44 Thorax with distinct vittæ. 45
Thorax without distinct vittæ. 50

45 Last section of fifth vein only half as long as the cross-vein, (New Jersey). . . . . *princeps* Wheeler.
Last section of fifth vein as long or longer than the cross-vein. 46

46 Last section of fifth vein about the same length as the cross-vein. 47
Last section of fifth vein distinctly, although only a little longer than the cross-vein. 49

47 Legs and feet black; knobs of halteres infuscated, (New Jersey). . . . . *modestus* Van Duzee.
Tips of femora, tibiæ, base of tarsi and knobs of halteres yellow. 48

48 Tips of third and fourth veins close together, as is typical of the genus; rather large species, (California). . . . . *californiensis* Wheeler.
Tips of third and fourth veins a little wider apart than usual, (North America). *veles* Loew.

49 Abdomen and pleuræ black; face opaque with brown pollen; thoracic vittæ very distinct; tips of third and fourth veins rather far apart, (North America). . . . . *veles* Loew.
Abdomen, pleuræ and face distinctly green; thoracic vittæ less distinct; tips of third and fourth veins close together as usual in the genus, (New York; New Jersey; Alaska). *distinctus* Van Duzee.

50 Legs yellow; cross-vein with a stump vein at its center, (Wyoming). . . . . *appendiculatus* Wheeler.
Legs black, at least the femora largely black; cross-vein normal, without a stump vein. 51

51 Knobs of halteres infuscated, at least on one side, (New Jersey). . . . . *modestus* Van Duzee.

Knobs of halteres yellow. 52

52 Last section of fifth vein only half as long as the cross-vein, (California). . . . . *xerophilus* Wheeler. .

Last section of fifth vein a little longer than the cross-vein, (specimens in which the thoracic vittæ are obsolete), (North America). . . . . *veles* Loew.

Last section of fifth vein twice as long as the cross-vein, (New York; New Jersey: Alaska). . . *distinctus* Van Duzee

53 Posterior cross-vein with a stump vein near its center, (California). . . . . *xerophilus* Wheeler. .

Cross-vein normal, without a stump vein. 54

54 Posterior basitarsus narrowed at base below and with a small tooth on this narrowed portion. 55

Posterior basitarsus without a tooth below, not narrowed at base. 56

55 Small species, 2 mm.; third and fourth veins rather far apart at their tips for the genus, (North America).... . . . . *veles* Loew.

Larger species; 3 mm. or over; third and fourth veins with their tips close together as usual in the genus, (California). *californiensis* Wheeler.

56 Last section of fifth vein only half as long as the cross-vein, (California). . . . . *xerophilus* Wheeler. .

Last section of fifth vein longer than the cross-vein, or equal to it in length. 57

57 Last section of fifth vein and the cross-vein of nearly equal length; knobs of halteres more or less infuscated, New Jersey). . . . . *modestus* Van Duzee...

Last section of fifth vein much longer than the cross-vein. 58

58 Length of last section of fifth vein to cross-vein as 14 to 10, (Texas). . . . . *albisetosa* Van Duzee, new species....

Last section of fifth vein twice as long as the cross-vein, (New York; New Jersey; Alaska). . . *distinctus* Van Duze

THE DESTRUCTIVE MEXICAN BOOK BEETLE COMES TO BOSTON[1]

By Raymond L. Taylor.

Since so many of the most destructive insect pests of the United States are of foreign origin, and also, since so many of these undesirable immigrants have made inconspicuous entrances into the country on nursery stock, food stuffs, and other merchandise, any record of an exotic, which is destructive, and which has entered the country, should be of wide interest. Undetected, the Mexican book beetle definitely invaded the Port of Boston recently.

On Dec. 12, 1927, attention was called to the condition of a large shipment of books which had been received by N. J. Bartlett and Co., a Boston firm of book sellers. Help in the matter was asked and the damaged stock was inspected. The shipment comprised 29 sizable packing cases and represented the entire library, of fully 8000 volumes, of the late William T. Brigham, Director of the Bernice Pauahi Bishop Museum, Honolulu, Hawaii. Dr. Brigham was a noted bibliophile and his collection, which embraced much on ethnology and natural history and contained many rare editions, was conservatively valued at over $25,000. At the death of Dr. Brigham, the books, presumably in perfect condition at that time, were packed in substantial wooden cases and stored in a warehouse in Honolulu for several years. Recently, they were purchased by the book concern mentioned and delivered in Boston in early December, 1927. When the books were unpacked, although the newspaper wrappings showed no evidences of injury, there was scarcely one of the collection not riddled by larval galleries and exit holes. Some of the books had only one or two borings, while others were so completely riddled that some pages were virtually consumed in their entirety and the remainder illegible. The majority, however, suffered severe injury to the bindings but were legible in spite of cleanly cut, circular holes, 1.5 to 2.3 mm. and oblique, larger holes, all of which extended from part way to all the way through the book. The work was confined to the covers in many other cases and cleanly cut, circular holes of about 2.3 mm. were very common in the backs. It was significant that old volumes with hand-made paper had their pages well perforated, while in recent books with clay-filled, chemical-laden paper, the injury was restricted to the binding. Also of significance, was the fact that some of the books, which were damp and marked by a brown mold, were comparatively immune to severe damage. The galleries in the covers were irregular, often appeared to radiate from a common center, and, in general, resembled to some extent, Scolytid work in wood. There was remarkably little frass and the insects which caused the destruction were not readily visible. Indeed, this latter point was a mystifying feature of the problem. Dr. Brigham had had the reputation of taking excellent care of his library and the condition of his books was well rated in collectors' lists. Since, by this presumption, the extensive damage had occurred in the two to three years the boxes had been in storage and in transit, there should have been ample insect remains. To the contrary, there was an almost complete absence of these and a great scarcity of living larvæ and adults. The probable solution of this, however, was found and will be mentioned later. It should be evident from the foregoing that these book injuries were much more considerable than might be expected of any common book insect, of which there are, relatively, but a few known.

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[1] Contributions from the Entomological Laboratory of the Bussey Institution, Harvard University. No. 290.

A preliminary search for the cause of this destruction, after an examination of at least fifty books, at length yielded three living larvæ and the intact bodies of two adult beetles, either dormant or dead. Mr. C. A. Frost kindly identified the coleopteron as a species of *Catorama*, family Anobiidæ. A review of the literature inspired the conclusion that this insect was, very probably, either *Catorama mexicana* or *C. herbarium*, and, at the same time, raised the interesting question, whether or not these two species might not be synonymous.

Catorama (or *Cathorama*) *herbarium*, in the literature, is usually ascribed to Gorham, but in Gorham's own book[1], where it is described, he ascribes it to "Chevrolat, the Sallé Collection, Habitat Mexico, Cordova (Sallé)." This species seems widespread throughout tropical America, and is reported as injurious to books, leather goods, upholstery, furniture, woods, etc. in Brazil, Grenada, Barbados, St. Vincent, and other West Indian Islands. It is considered much more destructive than any other book pest.

Catorama mexicana, which is listed in the Fauna Hawaiiensis and there ascribed to Chevrolat, has been reported a number of times as highly injurious to books and leather goods, has also been found in tamarind bark and has been bred out of velvet bean seeds. It seems distributed throughout the Hawaiian Islands.

Since this species, *C. mexicana*, is not listed in Junk's Coleopterorum Catalogus (1912) nor to be found elsewhere, there remains the decided possibility that an error has been made and that these two names are synonymous. An error in transcription, once made, might easily be perpetuated indefinitely, or until the genus was revised. The common name, Mexican book beetle, has been given to *C. mexicana* by a committee of the Hawaiian Entomological Society and this common name would be equally applicable in every way to *C. herbarium*.

A brief description of the insect found may not be amiss. The larva, about 3.5 mm. in length, is a light grayish-cream colored little grub, somewhat thickly covered throughout, including the head, with fine, rather long, yellow hairs. The head is unicolorous with the body and not heavily chitinized except for the mouthparts and surrounding parts. These latter parts are light brown to darker, and the mandibles are tipped with black. The adult is a typical *Catorama*, a reddish-brown, ovoid-rectangular beetle about 3 mm. in length. The anterior portion of the elytra and dorsum of the head are smooth and polished; the cheeks and the remainder of the elytra, as well as the ventral parts, are covered with a fine, light yellow pilosity.

In regard to the life history of *Catorama herbarium*, de Faria says that the eggs are laid on the bindings or leaf-edges of books.

[1] Biologia Centrali-Americana, Vol. 3, Part 2, p. 207.

The eggs hatch in 5-6 days (in Brazil) and the young larvæ seek the paste of the bindings at first, but when they grow stronger, they attack the bindings themselves and feed until ready to pupate. The larvæ then tend to return to the external surface, which, in the case of books on library shelves, is the back bindings of the volumes. They increase the size of their mines and cover them with roofs of excreta and paper. The adults emerge through cleanly cut holes, thus the characteristic perforations in the backs of books are the exit holes. These perforations may be re-entered for the purpose of oviposition, although the act itself was never observed. De Faria adds that these beetles are nocturnal in habit in that, in hot weather, they may issue from the books at night and go to the windows of the room containing the library. In Sao Paulo, Brazil, the breeding season seems to be from October to December but during these months all stages of *Catorama* may be observed. The observations made in Boston on the habits of this destructive "book worm" follow.

Since the beetle is indigenous to the tropics, any life cycle in Massachusetts would, without doubt, be different from its cycle under tropical conditions, if, indeed, the species could persist here. It seems very probable that the fluctuations in humidity and especially the temperature changes of the seasons, so different from the climate of Hawaii, for example, would render impossible continued breeding of the insect in New England. A life cycle of insects raised in a greenhouse might be indicative if a humid climate of the correct sort could be approximated. It is exceedingly interesting, however, that, in spite of the time of year, an appreciable number of *Catorama* larvæ survived the conditions of transportation from Honolulu to Boston and that, since their arrival in early December, 1927, at room temperatures of from 40 to 65 deg. F., both in the book store and in the laboratory, they have shown no abatement of activity.

From this fact, there arises at once the serious possibility of the destruction of books in libraries which are heated in winter, should this insect be introduced. It seems improbable that books kept in well lit situations and in active circulation would be infested, nor does modern paper appear to be the ideal diet of the beetle larva, yet, with little used books, which are kept undisturbed in darkness, or with rare books of leather and handmade paper, there remains the possibility of an approximation here of the extensive injury caused in tropic libraries.

Three living larvæ and two adults, either dormant or dead, with hand-made paper for food, were placed in a glass vial which was subsequently corked. The vial was then placed in a desk drawer. Observations were made from time to time and they yielded several interesting results. A few days after these insects were confined as described above, it was noted that there were but *two* larvæ. A careful examination revealed a few particles of the other larva, which had evidently been eaten by the surviving two. Unfortunately, it can not be stated whether or not the larva was killed by its companions or died from some other cause before its body was used for food. It was noted, at the same time, that these two larvæ had begun to consume the adult beetles as well. During a period of a week, the interiors of the two bodies were exhausted and thereafter the external, chitinized portions were broken into small fragments. It was impossible to ascertain whether or not these bits of the chitinized parts were actually eaten, but they were finally reduced, on the whole, to rather small particles. When the larvæ were finished with the remains of the adults, they both ate into the cork stopper. One larva, which mined on the surface, produced a furrow 11 mm. long and about as wide as its body, or 1 mm., while the other commenced a mine obliquely leading into the heart of the cork. After an absence of observation for ten days, it was found that but *one* larva was present. The inference is that this suvivor had eaten the other. This remaining larva continued to mine into the cork for a depth of 9 mm. and then turned about and widened the mouth of the boring. This total activity took three weeks time after which, the grub crawled out upon the handmade paper and seemed as vigorous as ever although it had been bottled over five weeks. It is worthy of mention that the handmade paper was not eaten, and that protein and cork were preferred, apparently.

The cannibalistic habit of the larvæ, if at all general, would adequately account for the surprisingly few insects found in the books examined, in proportion to the extensive mines, and with a consideration of the probable elapsed time of two to three years. No other explanation was conceived that seemed to fit all the facts as well.

In view of the persisting activity of this Catorama beetle at room temperatures, since further examination of other volumes at the book store continued to show living larvæ, and with an estimation of the chance of this pest spreading to uninfested volumes under the same roof and, perhaps, even gaining a foothold in the many heated libraries in Metropolitan Boston, it was agreed that a thorough program of fumigation with carbon bisulphide should be carried out. In spite of the remote contingency of a spread of this exotic pest to other libraries, adequate control measures were obviously justified. It would seem a safe rule, that, in general, any immigrant insect with destructive proclivities should be regarded as dangerous, and treated as such, at least, until all of its habits are known and its potentialities duly measured.

Abstract.

A tropical Anobiid, *Catorama* sp., either *C. mexicana*, the Mexican book beetle of the Hawaiians, or *C. herbarium* of the West Indies (if they are not synonymous, as they may be), inflicted severe damage to a large shipment of books from Honolulu to Boston. Larvæ have been active and have fed for at least seven weeks in Massachusetts at room temperatures, and the possibility of infestation of heated libraries throughout the city is advanced as adequate justification for a thorough carbon bisulphide treatment of the infested stock. In general, any imported noxious insect should be treated as a menace, at least until all of its habits are known and its potentialities measured.

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NOTES ON THREE ABNORMAL ANTS[1].

By W. S. Creighton

Abnormalities in ants appear to fall into three fairly well defined categories, viz.: (1) sex mosaics and intersexes, (2) aberrant forms produced through altered food supply, (3) freaks. To the first group belong the various kinds of lateral mosaics as well as the rarer anterio-posterior type. The latter often show characteristics which mark them as intersexes rather than true mosaics. The second group is composed of a large number of peculiar forms which arise from pronounced nutritional irregularities. Lack of food may produce dwarf individuals in all three castes, while loss of food due to the presence of parasites gives rise to pseudogynes or the shriveled victims of *Orasema*. In the event of an overabundance of food unusually large males and females, egg-laying workers and, more rarely, repletes may result. It is impossible to draw any hard and fast line between the members of this group and those forms considered normal since in many cases conditions which originally must have been quite aberrant have, in time, become an integral part of the life of the species (e. g. the repletes of *Myrmecocystus* or the microgynes of certain *Formicas*). In the third group may be included those individuals which show duplication, loss or malformation of parts. Most of these conditions seem to be due to injuries in the larval or pupal stages. More rarely the changes are of an atavistic nature. Many of the members of this group are veritable entomological nightmares, monstrosities with double scapes or legs; fantastic creatures with shortened and twisted antennæ and limbs or misshapen thoraces; freaks without eyes, or lacking tarsal, antennal, rarely even petiolar joints.

In this paper are described three abnormal ants, two freaks and an ergatandromorph. Both freaks are in the collection of Dr. Wheeler through whose kindness I am enabled to describe them. It is therefore my pleasure to thank the donors for their contributions. The first of these, a queen of *Monomorium minimum* Em. which lacks the left eye, was taken at Urbana, Ill. by Mr. M. R. Smith. Plate. 1, Fig. 4 shows the head of the insect. The asymetry caused by the absence of the left eye is further increased by a narrowing of the same side of the head. The left half is very little more than half the width of the right except just behind the mandible where it suddenly flares out to full width. The left ocellus is misshappen and displaced. Dr. P. W. Whiting informs me that similarly deficient individuals occasionally arise in his *Habrobracon* stocks, and when, as more rarely happens, both eyes are absent, extreme microcephaly results. No dissection was made of the insect here described but it seems likely that the greater portion of the left optic tract is absent. The cross sectional area of the mandibular muscles must also be greatly reduced. In all other regards the specimen appears to be perfectly normal.

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[1] Contributions from the Entomological Laboratory of the Bussey Institution, Harvard University, No. 291.

The second abnormality is a dealated queen of *Myrmica scabrinodis* var. (probably *sabuleti* Mein.) which lacks both petiole and post petiole. This astonishing insect was found by Miss H. Andrews at Boulder, Colo. in 1916. Figs. 5 and 6 show the thorax and abdomen in profile and from above. The thorax is joined directly to the gaster, the two petiolar joints having fused with the anterior face of the first gastric segment. The joints are broadened and flattened past recognition, forming a fan-shaped area on the gaster. Nevertheless their nature is strikingly apparent because of their characteristic rugose sculpture and lighter color. On the right side of the gaster close to the fused nodes is a small tubercle. It has no apparent connection with them nor any obvious significance. At least two similar abnormalities have been previously described. Donisthorpe, in 1922, published a short paper containing an account of a dealated queen of *Leptothorax acervorum* F. which lacks the petiolar joints. The altered condition of this insect he considers an atavism. In 1927 Karajew described an aberrant worker of *Megaponera fœtens* F. in which the petiole is absent. Unfortunately the insect was not figured but the author notes that in other respects it was normal.

The last specimen to be dealt with in this paper is an ergatandromorph which I took in the summer of 1927 at Boulder, Colorado. On August 10th while collecting along the foot of the ridge between Gregory and Bluebell Canyons, I found a nest of *Formica nitidiventris*, Em. containing an ant with wings on the left side only. The insect was in the upper galleries of the nest in the company of twenty or thirty workers. The latter fled as soon as the covering stone was raised, leaving the ergatandromorph whose slower movements hindered its escape. When allowed to walk on a relatively smooth surface it circled to the right.

Fig. 1 shows the more important features. The left half of the insect is male, the right worker, although in the head and thorax the junction does not occur at the mid-line of the body. The structures of the opposite sides of the head appear to be quite typical as regards their respective castes. The right (worker) antenna has the requisite twelve joints of the customary shape and size. The right eye and mandible differ in no way from those of the normal worker. On the left (male) side the eye is much larger, the mandible greatly reduced and the antenna of thirteen joints, all usual male features. The clypeus is twisted to the left, a result of the obvious discrepancy in the length of the genæ (Fig. 2.) Aside from the major structural differences in the males and workers of this subspecies there are certain pecularities of color and pilosity characteristic of each. Thus the head and thorax of the normal worker are a rufous brown and those of the male a deep brownish black. In Figs. 1 and 2 this darker male coloration has been indicated by stippling. Referring to 2 it may be seen that the entire clypeus and most of the vertex and occiput are of worker origin. There is also a curious projection of worker tissue which runs downward from the vertex to the upper border of the eye. All three ocelli occur in worker tissue and all are of the small size characteristic of the worker.

Taking into consideration the radical differences in the thoracic structured of the male and worker the thorax of the mosaic is less mixed than would appear at first sight. The prothorax of the worker has fused fairly evenly with the pronotum of the male. The mesothorax is united with the scutum, the parapsis and the scutellum. The small metanotum of the male is apparently free throughout the greater part of its length. It lies in a deep suture which extends entirely across the thorax. The last portion of the thorax appears to be intermediate in structure between the metathorax of the worker and the epinotum of the male. Its color would indicate worker tissue but its structure is not that of the typical worker metathorax. Both wings are present on the left side of the insect and both are fully developed. The petiole is cleanly divided along the midline of the body. The right half is higher and broader than the left and has an acute upper edge. The upper edge of the left half is obtuse and the coloration is a blackish brown.

The differences in the shape of the opposite halves of the abdominal segments cause a pronounced asymetry of the gaster. Since the gastric segments of the normal male are of nearly uniform length throughout, while those of the worker successively decrease in length after the second segment, their combination has resulted in a strong bending of the tip of the gaster towards the right. This bending has affected the male genital armature. All the elements in the left half of the male genetalia are present and individually quite normal[2]. Their relative positions, however, have been somewhat altered. In the normal male the stipites are outermost in position. Just within and closely appressed to each of these is a bifurcate organ composed of an outer, hooked volcella and an inner, foliate lacinia. Innermost of all and somewhat above the rest are the paired inner paramera. In addition there are present two small lobed structures, the cerci. Ordinarily these lie just above the median lobes and are partially covered by the sixth gastric segment. They are apparently not a part of the genetalia and are mentioned here only because a single aberrant cercus occurs in the gynandromorph. Fig. 3. shows the position of the male genital armature in the mosaic. The stipes (s) has been turned inward toward the center so that it occupies a position above the volcella (v) and lacinia (l) and the inner paramer (p). The ends of these may be seen projecting to the right of the stipes.

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[2] Emery's nomenclature is here used. For a discussion of the names applied to the structures of the Formicid genetalia see Emery, Die Gattung Dorylus. Mol. Jahrb Band 8 1895.

Above the stipes is the sixth gastric segment of the male. Near the base of the stipes is the small, club-shaped cercus (c). It is entirely exposed and borne on a small extruded portion of unchitinized tissue. The very characteristic circular, hair-fringed anal aperture of the worker, if present, is distorted past recognition.

The legs of the two halves of the mosaic are normal for male and worker respectively. Those of the male side are darker and somewhat more curved than their opposites. Measurements show them to be slightly shorter. The figure cannot be used in this connection since no attempt was made to draw opposite appendages in similar positions. The difference in length is such that one would expect the insect to circle gradually to the left when walking. Actually, as has been noted, it circled sharply to the right, a result probably due to the distortion of muscles in the thorax.

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ANTHEMOESSA ABRUPTA.

By Charles Robertson,

Carlinville, Illinois.

On the habits, parasites and inquilines see Frison (**1**). Some local observations are added here.

Phenology.—Flies 84 days, My 7 — Jl 29, ♂ 51 days, My 7— Jn 26, ♀ 81 days, My 10 — Jl 29. The male beigns 3 days, and ends 33 days, before the female; 7.4 less and 15.2 more than the average of the "5 other long-tongued bees," and 5.9 less and 12.9 more than the general average in **14**.

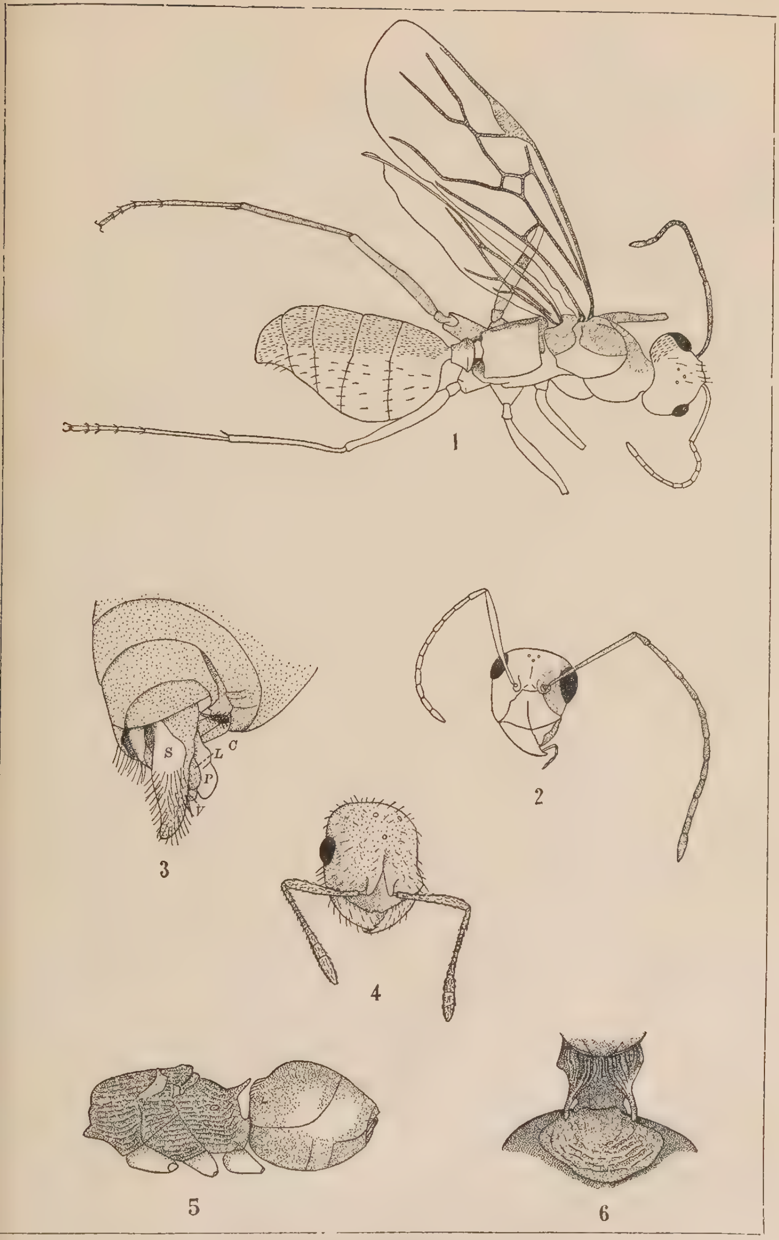
Anthophora ursina begins 29 days earlier, *Clisodon terminalis* begins 18 days later and *Amegilla walshii* 60 days later. Phenologically at their most active time these are rather non-competative.

At St Louis Rau (**4**) noted this bee from My 28 to Jl 21, 55 days, 29 less than the local flight. In about 33 years of local field work, Jl 1884–My 1916, I found the male visiting 26 species of flowers. The fact that the flight of the male never ranged over 51 days seems to show that the weather has little to do with it.

Comparison with Melitoma.—Rau says that when the life cycle of this bee had run its course, *Entechnia taurea* made its appearance. At Carlinville *Melitoma taurea* appears 48 days later and ends 70 days later, but it overlaps with *A. abrupta* for 33.9% of its flight. It flies 106 days, ♂95, Jn 24 – S 26, ♀ 103, Jn 27 – O 7. At St Louis Rau gives 94 days, ♂44, Jl 31 – S 12, ♀ 94, Jl 16 – O 17, the female beginning 19 days later and ending 10 days later than at Carlinville.

Rau says: "The males of this species do not seem to emerge before the females; or at least they do not die earlier." At Carlinville the male begins 3 days, and ends 11 days, earlier than the female, 7.4 and 14.8 less than the average of the "5 other long-tongued bees" and 5.9 and 17.1 less than the general average in **14**.

Generic selection.—The 5 local Anthophoridæ form a good example. *Anthophora ursina* is probably related to *A. pilipes*



CREIGHTON—ABNORMAL ANTS.

of Europe, *Anthemoessa abrupta* to *A. bomboides*, *Clisodon terminalis* to *Anthophora furcata* of Europe, if not the same, *Amegilla walshii* to the south-western *A. smithii*, and *Emphoropsis floridana* to southern and western species. These are the most heterogeneous. Geographically they avoid competition with 95.58% of the species mentioned in **3**.

Heterotropy.—Some writers have attributed what they call "oligotrophy," meaning few or exclusive visits, to limited tongue length and synchronism. The male, with a shorter tongue and a flight shorter by 30 days, they would expect to be more limited than the female. There are fewer flowers in the 51 days of the male than in the 81 days of the female. But the male occurs on 26 flowers and the female on 17. The female is alone 33 days, Jn 27 - Jl 29. . Of 250 native July flowers, 99, 39.6%, begin to bloom, so that the female might be expected on a good many flowers on which the male does not occur. But only 5 flowers are visited by the female alone, while 14 are visited by the male alone. The experimental augurs, who assume the simplicity of reactions, may undertake to account for this.

Flower visits (31).—♀ collecting pollen (6)—**Ebenaceae** *Diospyros virginiana*; **Libiatae:** *Scutellaria versicolor*; **Liliaceae** *Polygonatum commutatum*; **Rosaceae;** *Rosa humilis, setigera*; **Scrophulariaceae:** *Penstemon lævigatus.*

♀ s. (11).—*Asclepias purpurascens*; *Convolvulus sepium*; *Dianthera americana*; *Frasera carolinensis*; *Glechoma hederacea. Monarda bradburiana, Teucrium canadense*; *Hydrophyllum virginicum*; *Mertensia virginica*; *Rubus villosus*; *Trifolium pratense.*

♂ s. (26:14).—*With female*: A. pur.; D. amer.; D. vir.; F car.; G. hed., M. brad., S. ver.; H. vir.; M. vir.; P. læv.; P com.; T. prat. *Alone*: *Aesculus hippocastanum*; *Asclepias syriaca*; *Blephilia ciliata, Leonurus cardiaca, Stachys palustris*; *Cornus amomum*; *Delphinium tricorne*; *Gillenia stipulacea*; *Iris haxagona*; *Melilotus alba, Trifolium repens*; *Pastinaca sativa*; *Pentstemon pubescens*; *Triosteum perfoliatum.*

Oligotrophy.—This bee is an oligotrope of Hb and Ma. It shows 80.6% under Hb, 64.5 under Ma and 54.8 under red. Of the female pollen visits all are under Ma and 50% under red. Of the female nectar visits, 54.5 are under Ma and 63.6 under red. The total female visits show 70.5 under Ma and 58.8 under red. The male visits show 65.3 under Ma and 53.8 under red. The total visits show 22.5% under Labiatæ. The bee visits flowers of 17 families.

Literature.—My lists show the sexes and whether the females were collecting the pollen or not. Knuth (2) notes the pollen collecting but ignores the other data. It is not clear why those using these data think the distinction is unimportant. They evidently do not approve of making them. I found the female on 17 flowers and the male on 26. The female was observed collecting pollen on 6 flowers and sucking on 11. The male was taken on 12 flowers also visited by the female and on 14 flowers on which the female was not observed. The bunglers reduce all of these to collectors notes. Even as such the distinction is important. The 12 flowers on which both sexes were taken are the best places for the collectors to look for both. Both sexes are flying only in 57.1 per cent of the time of the species. The surest place to find the female, however, is on *Rosa humilis* and *setigera*, where the male does not occur. Of the 31 visits, 5 were made by the female alone, 12 by both sexes and 14 by the male alone.

Knuth mentions 16 of the above. Lutz and Cockerell (3) mention 9, of which 2 were not in Knuth's list, so that their list ought to give 18. The cryptic bibliography of these authors is well adapted to cover up the literature. They say "Doubtless some of the papers dealing with flowers and bees have been overlooked." The first of my Botanical Gazette papers cited by them is "Robertson 1895, Botanical Gazette XX." That is Flowers and insects XIV, concealing the fact that I-XIII were overlooked. Of the first 19 papers, they cite only 4. On *Anthemoëssa abrupta* they overlook one-half the cases[1].

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[1] In the case of *Emphor bombiformis*, under "Knab, 1911, p. 71, 'Drinking' habits," they say: "See Robertson 1918", as if it were second-hand. Frison evidently thought so and ignored it. What "Robertson, 1918" shows is that Knab's paper was second-hand by 21 years and erroneous in every particular. It shows also that, as regards drinking habits and relations to *Hibiscus*, Grossbeck's and Nichols' observations were second-hand by 21 and 23 years.

Under *Bombus americanorum* and *B. fervidus* Lutz and Cockerell cite Coville 1890 on the "elatus" question and say "see also Robertson 1890" as if the latter were second-hand, in spite of the fact that it is cited by Coville himself and anticipates his paper in almost every particular.

Frison says: "Robertson (1891, 1894, and 1896), in Illinois, records males and females of etc." Here "Illinois" means "Carlinville." Only 3 of the flowers mentioned showed both sexes. Frison follows Lutz and Cockerell in overlooking most of the Botanical Gazette papers and "Labiatæ" as well as Knuth's work.

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13. ......, 1896 (5). Fls. XVI. Bot. G. **21**: 266-74.

14. ......, 1918 (11). Proterandry & flight of bees. Ent. News **29**: 340-2.

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[2] Bull, A. M. = Bulletin American Museum Natural History; Fls. = Flowers and insects; St. L. A. = Trans. St. Louis Academy of Science.

LOCALITIES OF INSECTS COLLECTED BY CHARLES ROBERTSON

By Charles Robertson,
Carlinville, Illinois.

References to my collections, observations and descriptions of insects relate to Carlinville, Illinois, and to Inverness and Orlando, Florida. Exceptions are some Oxybelidæ and 5 bees, *Parandrena wellesleyana*, *Macropis morsei*, *Panurgus novæ-angliæ*, *Sphecodes davisii* and *Halictus hartii*. The last, Hart's number 17211, is the only Illinois bee in my descriptions which was not taken by me at Carlinville. "Southern", "South," "So.", "S.", "Macoupin County," and "Illinois" mean Carlinville. Some specimens marked "S. Illinois" were credited to "Illinois," the authors regarding that as sufficient.

Likewise, "Southern," "So.," and "S." Florida mean Inverness or Orlando. The "S. Florida" on my labels meant South Florida, which is not the same as Southern Florida.

Specimens numbered on white slips were taken on flowers by me at Carlinville. Of those numbered on red slips, 3346-3503 and 7021-7043 were taken at Orlando, Feb. and Mar., 1887, 1888, all the rest at Inverness. Some specimens sent for determination did not have my regular numbers, but 1-11 etc.

A NEW BEE OF THE GENUS ANDRENA VISITING SENECIO

By T. D. A. Cockerell,
University of Colorado, Boulder, Colo.

In a large genus like *Andrena*, the discovery of a new species excites little interest, but the one now recorded has rather special claims. At Winfrith, Dorset, in England, on April 20, 1921, my wife and I had the pleasure of collecting both sexes of the beautiful *Andrena* (*Trachandrena*) *albicans* Müller. When I put the specimens away in the *Trachandrena* box, I remarked that whereas the North American fauna was rich in this group, there was nothing quite so beautiful as the English cousin, with bright red hair on the thorax above, white hair on the pleura, and bandless abdomen. However, on May 17, 1927, Mr. Chas. Wagner, one of my students, captured an *Andrena* on *Senecio* flowers at White Rocks, near Boulder, Colorado. When he brought it in, I said, "Where have you been? You must have been to England!" Superficially, it was just like A. *albicans*, though closer inspection showed various differences, thus the pleura is black haired, and the hair at end of abdomen is black, not red. It may be described thus:

Andrena seneciophila n. sp.

Female. Length nearly 11 mm.; a typical member of the subgenus *Trachandrena*; black, including antennæ and legs, tegulæ brown; head ordinary, face broad; process of labrum broadly truncate; malar space linear; clypeus coarsely and quite closely punctured, the punctures tending to run in longitudinal lines, apical third with a median smooth line; facial foveæ seen from above seal brown, running close to eyes separated by a shining band, extending downward to level of top of clypeus; third antennal joint not quite as long as next two together; hair of head thin, mostly black, but red on occiput, and slightly reddish in region about antennæ; mesothorax and scutellum dull and densely punctured, the surface covered with short stiff very bright fox-red hair, which also covers postscutellum, and extends down sides of thorax to cover tubercles and immediately adjacent parts; sides of metathorax with pale hair, which carries a great quantity of the orange *Senecio* pollen; mesopleura with black hair; wings dusky, darker apically; stigma well developed, rufo-piceous; nervures dark brown; second cubital cell broad, receiving recurrent nervure a little beyond middle; legs with black hair, spurs brown; abdomen shining, finely and rather closely punctured, without bands, hair at apex black; second segment depressed more than half, but hardly two-thirds. The area of metathorax is broadly triangular, with about sixteen strong longitudinal rugæ. The tongue is remarkably short, broad and pointed.

The problem of the independent production of superficially similar species of insects is an interesting one. I do not know whether the two species just discussed are really very closely related, but they are at any rate both *Trachandrena.* In California, there is another species with the same appearance, *A. macrocephala* Ckll., the female of which was taken by Mr. Timberlake at Riverside, at flowers of *Phacelia distans*, March 8. This even agrees wit *A. seneciophile* in the black-haired pleura and black hair at end of abdomen. Yet it is not even a *Trachandrena*, and the structure of metathorax and second abdominal segment are entirely different. In the Mediterranean region, there is a *Senecio*-visiting species, *A. senecionis* Pérez. I have it from Spezia, Italy (Morice). It has rufescent dorsal hair, but is not a *Trachandrena.*

A NEW CŒLAMBUS FROM A THERMAL SPRING IN NEVADA.

By H. C. Fall,
Tyngsboro, Mass.

Coelambus bruesi n. sp.

Narrowly ovate, perceptibly attenuate posteriorly. Head and elytra fuscotestaceous, the clypeus in front diffusely paler, the lateral margins of the elytra somewhat so. Prothorax typically yellow, vaguely infuscate postero-medially.

Head minutely alutaceous and finely sparsely punctate. Antennæ pale basally, outer half infuscate.

Prothorax finely margined at sides, these nearly straight and continuous with the sides of the elytra; surface polished, punctuation fine and rather sparse on the disk, becoming close and somewhat coarser along the front and rear margins.

Elytra polished, sculpture consisting of finer and coarser punctures intermixed, the disparity more conspicuous in basal half.

Body beneath black, polished; metasternum and coxal plates coarsely and closely punctate except at middle; venter coarsely punctate laterally at base, elsewhere finely and sparsely so. Legs either entirely pale or with the femora darker medially. Front and middle tarsi of male distinctly dilated, the 2nd joint widest; anterior protarsal claw of male a little thicker and more strongly curved.

Length 3.5 mm.; width 1.8 mm.

Described from a single pair (♂ ♀) taken by Prof. C. T. Brues at Ruby Valley, 65 miles south of Wells, Nevada, in a hot spring; temperature 39.2°-40.°C.

This species is clearly to be associated with *compar* and *nigrescens* by its dual system of elytral punctuation and the conspicuously wide second joint of the male protarsus. The form is narrower and color typically darker than in *compar*, in which also the punctuation of the upper surface is somewhat finer and that of the metasternum and coxal plates distinctly sparser and less coarse than in the present species. As compared with *nigrescens* the present species is more ovate (more attenuate posteriorly), less dark in color, somewhat more coarsely punctate, with the disparity in size of elytral punctures less marked in the posterior half, and the second joint of the male protarsus a little smaller and less triangular.

The species is appppropriately and with pleasure dedicated to Prof. Brues, who kindly permits me to retain the male type. The female allotype will, at his suggestion, be deposited in the collection of the Museum of Comparative Zoology at Cambridge.

PROCEEDINGS OF THE CAMBRIDGE ENTOMOLOGICAL CLUB.

During the year 1927 eight meetings were held, with the following programs: February 8: Mr. W. L. W. Field, "The Background of the Early Work of Thaddeus W. Harris." March 8: Professor C. T. Brues and Mr. P. J. Darlington, Jr., "Insect Collecting at the Harvard Tropical Laboratory, Cuba." April 12: F. W. Dodge, "Over the Range (White Mountains, N. H.)," and Mr. J. H. Emerton, "Spider Notes." May 10: Mr. Arthur Loveridge, F. E. S., C. M. Z. S., "Observations on Some East African Insects." June 14: Mr. F. M. Carpenter, "Some Recent and Fossil Insects from Kansas, Colorado, and Texas." October 11: Summer collecting notes, by several members. November 8: Mr. P. J. Darlington, Jr., "Collecting Coleoptera in the Mountains of Washington and Oregon." December 13: Mr. F. M. Carpenter, "Collecting Fossil Insects in Western United States."

The Club lost one member by death, Mr. F. C. Bowditch, of Brookline, Massachusetts. Eight new members were elected, bringing the membership number to eighty.

F. M. Carpenter, Secretary.

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A regular meeting of the Club is held on the second Tuesday of each month (July, August and September excepted) at 7.45 p. m. at the Bussey Institution, Forest Hills, Boston. The Bussey Institution is one block from the Forest Hills station of both the elevated street cars and the N. Y., N. H. & H. R. R. Entomologists visiting Boston are cordially invited to attend

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